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A JOURNAL

of the CANADIAN DENTAL ASSOCIATION / de L'ASSOCIATION DENTAIRE CANADIENNE

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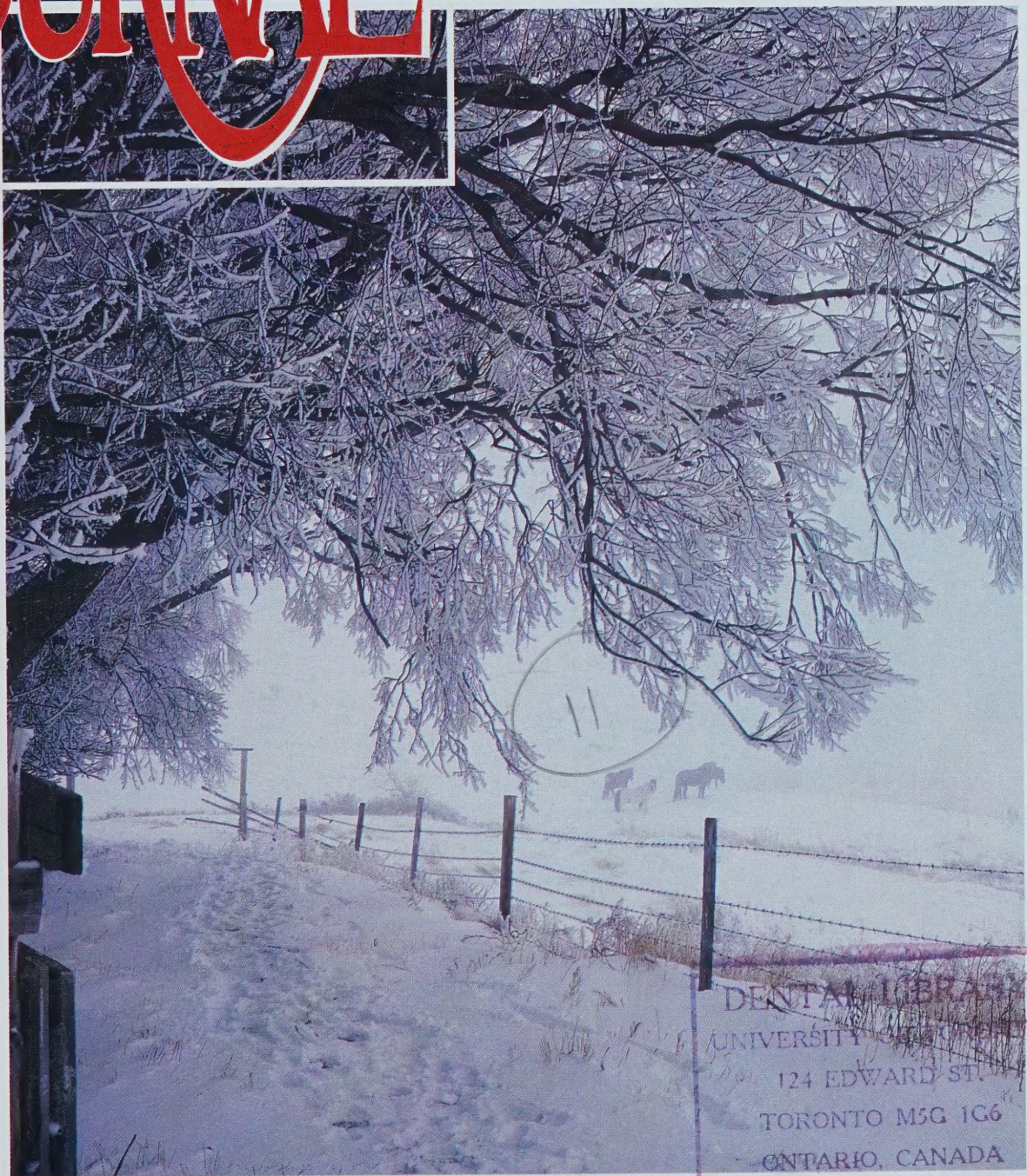
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January/
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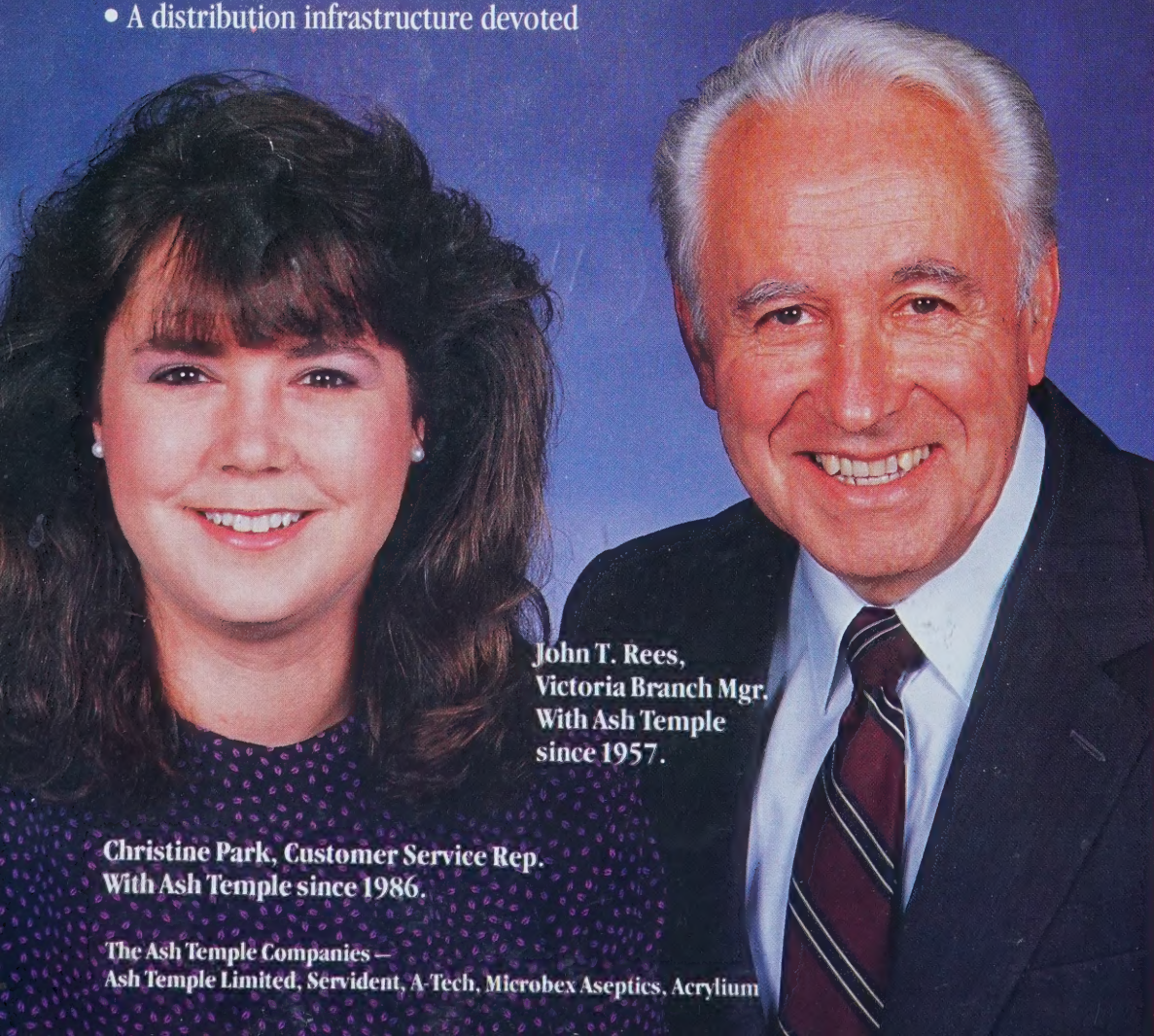
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Notice of change of address should be received before the 10th of the month, to become effective the following month.

Subscriptions: All subscriptions payable in advance in Canadian funds. In Canada - \$48 (+ GST); United States - \$53; all other - \$58.

Subscriptions are for 12 issues, not necessarily conforming with the calendar year. All statements of opinion and supposed fact are published on the authority of the author who submits them and do not necessarily express the views of the Canadian Dental Association, unless such statements or opinions have been adopted by the Association. The editor reserves the right to edit all copy submitted to the Journal. Publication of an advertisement does not necessarily imply that the Canadian Dental Association agrees with or supports the claims therein.

ISSN 0709 8936

PRINTED IN CANADA

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The Canadian Dental Association is the authoritative national voice, resource, and focus of unity for the profession of dentistry in Canada — dedicated to meeting member needs, and the promotion and provision of optimal oral health for Canadians.

JOURNAL

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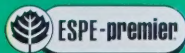


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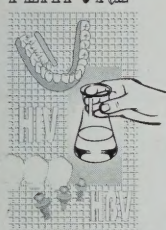


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CANADIAN DENTAL ASSOCIATION/
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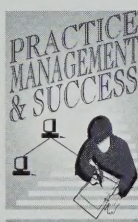
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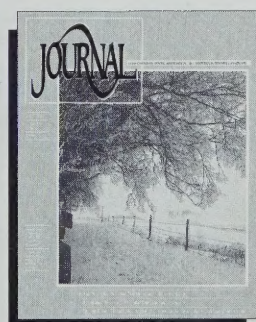
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Cover: A foggy February morning at Wildhaven Farm, Alberta. (Photograph courtesy of Dr. Wilber Samuel Tripp.)

CDA Members, look for your next issue of *Communiqué* with this issue of the Journal.

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ANNOUNCEMENTS

National Highlights

May 12-14, 1994: Newfoundland Dental Association Annual Convention. (709) 579-2362

October 2-8, 1994: Joint CDA/FDI Annual Dental Meeting, Vancouver, BC. (613) 523-1770, or 1-800-267-6354.

February/Février 1994

February 3-5: 2nd Catalan Congress on Odontostomatology/Dentalmat 94 at the Palacio de Congresos de Barcelona in Spain. For details, contact: The Official Association of Odontologist and Stomatologist of Catalina, Central Office, Via Laietana, 30, 4°F, 08003, Barcelona, Spain.

February 5: Xi Psi Phi Annual Alumni Day in Toronto, Ontario. For information, contact: Dr. John Wiles, (416) 293-3336.

February 10-12: International Dental Conference 1994, organized by the Dental Association of Malta at the New Dolmen Hotel, Malta. For information, contact: Malta University Services Ltd., University of Malta, Msida MSD 06, Malta.

February 16-20: Jamaica Dental Association 30th National Dental Convention at the Holiday Inn Hotel, Montego Bay, Jamaica. To register, write: Dr. D. Dyer-Morgan, Chairman, Jamaica Dental Association, PO Box 19, Kingston 5, Jamaica, W.I. For travel arrangements, call: Aurora Travel Service, 1-800-451-5421.

March/Mars 1994

March 3-5: Academy of Osseointegration Ninth Annual Meeting in Orlando, Florida. For information, contact: Academy of Osseointegration, 401 N. Michigan Ave., Chicago, Illinois, 60611-4267.

March 17-20: Hinman Dental Meeting in Atlanta, Georgia. Registration before February 15th, \$95; after, \$135. For details, contact: Thomas P. Hinman Dental Meeting, 60 Lenox Pointe, Atlanta, GA, 30334, (404) 231-1663.

March 19-26: 33rd International Alpine Dental Conference being held at the Hotel Annapurna, Courchevel, France. For details, contact: International Dental Foundation, 53 Sloane St., London, England, SW1X 9SW.

March 29-April 1: 91st Scientific Session of the Hawaii Dental Association, in Honolulu, Hawaii. For information, contact: Mr. Danny Park, executive director, Hawaii Dental Association, 1000 Bishop St., Suite 805, Honolulu, Hawaii, 96813. Tel: (808) 536-2135.

April/Avril 1994

April 8-9: Southern Ontario Surgical Orthodontic Study Group meeting in Windsor, Ontario. For details, contact: Dr. Jeff Berger (519) 258-2632, or fax: (519) 258-2637.

April 20-24: Annual International Educational Seminar of the American Academy of Cosmetic Dentistry, in Phoenix, Arizona. For information, contact: Ms. Maureen Steckman, executive director, AACD, 2711 Marshall Court, Madison, Wisconsin 53705.

April 21-24: Irish Dental Association Annual Scientific Conference, in Waterford City, Ireland. For further details, contact: Ms. Margaret Ferguson, Irish Dental Association, 10, Richview Office Park, Clonskeagh Rd, Dublin, 14.

April 21-23: British Dental Trade Association Dental Exhibition, at the NEC Birmingham. For information, contact: The British Dental Trade Association, 84 High St., Slough, Berks SL1 1EL, U.K.

April 24-26: Joint meeting of the Canadian Academy of Endodontics & Australian Society of Endodontology at the Maui Inter-Continental Wailea Hotel in Maui, Ha-

waii. For information, contact: Dr. Wayne Pulver, President, Canadian Academy of Endodontics, 159 Willowdale Ave., Willowdale, Ontario, M2N 4Y7. Tel: (416) 222-9900

April 27-May 1: 51st Annual Session of the American Association of Endodontists (AAE) at the Hilton Hawaiian Village in Honolulu, Hawaii. To register, contact: American Association of Endodontists, Annual Session Registration, 211 E. Chicago Avenue, Chicago, Illinois, 60611-2691. Tel: (312) 266-7255.

May/Mai 1994

May 14: Alberta Academy of Periodontology is holding a continuing education course entitled Current Concepts in Periodontics.

May 22-28: International College of Dentists Annual Meeting — European Section at the Jerusalem Hilton Hotel in Jerusalem. For details, contact: Dr. S. Sussman, Secretariat, ICD European Section, P.O. Box 50006, Tel Aviv 61500, Israel.

June/Juin 1994

June 2-4: Academy for Sports Dentistry Meeting in Pittsburgh, Pennsylvania. For information, contact: Dr. A.W.S. Wood, 1553 Randor Dr., Mississauga, Ontario L5J 3C6. Tel: (905) 823-2008.

June 6-10: 12th National Congress on Dentistry (Latin-American Meeting on Dentistry) at the Havana International Conference Center in Havana, Cuba. For more information, write: Palacio de las Convencios, Apartado 16046. La Habana, Cuba.

June 6-17: Pindborg Course in Oral Pathology given on the premises of the Danish Dental Association in Copenhagen, Denmark. For more information, contact: Anne Grethe Ingversen, Secretary, Dept. of Oral Pathology, School of Dentistry, University of Copenhagen, 20 Norre Allé, DK-2200 Copenhagen N, Denmark.

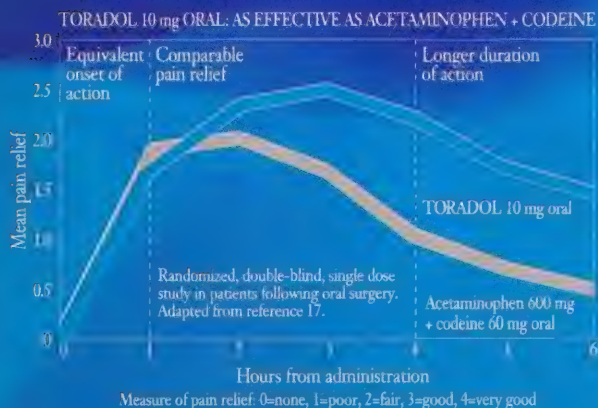
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JANUARY, 1935

RADIOGRAPHY IN DENTISTRY

by James Coupland, DDS

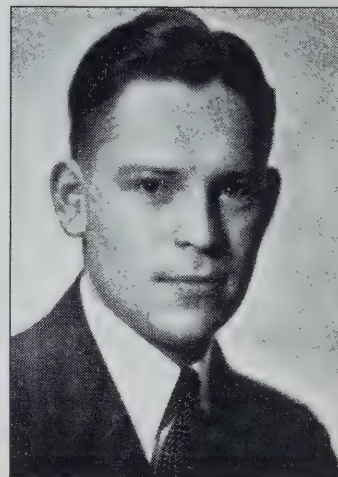
IN THE early stages of development, radiography was employed in dentistry to disclose areas of bone rarefaction at the apices of septic teeth. At that time, imperfections in the techniques limited its usefulness to the discovery of gross pathological lesions. Thus the idea arose that an X-ray examination served no other purpose than that to which it was first applied. This fallacious belief is held generally by the public, frequently by physicians, and occasionally by dentists. This misconception has seriously retarded radiodontia's potentialities. Refinements in the technical procedures and a broader knowledge of interpretation have opened up a field of usefulness of increasing and apparently infinite magnitude.

While the discovery of unhealthy periapical conditions is one of the most valuable applications of radiography to the practice of dentistry, it is by no means the only one. The X-ray when properly used is the most important instrument at the disposal of the dental profession for meeting the popular demand for preventive health services. It provides a means of detecting the incipient lesions of oral disease. The dentist is given thereby an opportunity to institute corrective treatment at a time when the prognosis is favorable and before irreparable damage is done. This is particularly true in relation to the most popularly known oral lesion, dental caries. A periodic X-ray examination reveals incipient decalcification occurring in proximal surfaces that cannot be investigated clinically as well as advanced cavities of an obscure nature and the recurrent caries that frequently develops under restorations. The information obtained in this connection is, in the writer's opinion, sufficiently valuable to justify the acceptance of a periodic X-ray examination as a routine procedure.

Thus radiography makes a very real contribution to the principle of pulp conservation. This policy seems to be the only satisfactory means by which we can eliminate the menace of the pulpless tooth. There has been a very noticeable trend in the dental profession toward the principle of pulp conservation. The decreasing number of root canal operations that are performed are evidence of this fact.

Retaining Infected Pulps

However, like every good principle, it may be carried to an illogical extreme. This ultra-conservatism has resulted in the retention of many



JAMES COUPLAND

pulps after they have been infected. Simpson¹ has called attention to the danger of this practice. He points out that such septic pulps have direct circulatory connections and consequently that they may be more virulent foci of infection than devitalized teeth of long standing. These degenerating pulps usually can be detected only by means of an X-ray survey because often the teeth respond normally to vitality tests. The radiographic evidence denoting their presence is a slight increase in radiolucence at the apex of the root or a break in the lamina dura. These changes are so minute that they may easily be obscured by technical deficiencies in the radiographs.

That periodontal as well as periapical sepsis may cause systemic disease must be recognized. Recent publications of qualified authorities like Box,² Gardner,³ Merritt,⁴ Fixott,⁵ and others emphasize that fact. Without exception, these contributors stress the value of the radiographic findings. In the detection and treatment of periodontitis, the X-ray is indispensable. It discloses many of the etiological factors such as deposits of calculus, faulty contracts, overhanging fillings and trauma. Frequently, periodontal pockets are found that would have been overlooked in the clinical examination. In advanced cases of periodontoclasia, the X-ray evidence is the most dependable index in determining whether the prognosis under treatment is favorable or whether immediate extraction is indicated.

Periodic Examination

In his crusade against cancer, Bloodgood,⁶ on the public platform and in his written articles, stresses the grave responsibility of the dental profession in prevention of malignancy of the mouth by detection of the predisposing lesions. He regards a periodic radiographic examination an indispensable adjunct to an adequate oral survey.

The requirements of a thorough examination are very exacting. Primarily, the radiographs must possess a high degree of technical excellence. Then great care and judgment must be exercised in interpreting them. Any deviation from the normal should be noted and a differentiation must be made between evidence of physiological processes and manifestations of pathological involvements. In a recent work, Simpson⁷ has comprehensively described and splendidly illustrated the normal conditions and the variations encountered in dental radiography.

When searching for oral foci of infection the edentulous spaces should be investigated radiographically. As the result of an extensive survey made at the Mayo Clinic, Gardner⁸ reports that 33.3 per cent of the edentulous mouths examined contained retained root fragments. Haden⁹ has established that these fragments not uncommonly are associated with residual infection. Haden and Mead¹⁰ have called attention to the frequent occurrence of residual infection where no fragments of tooth remain. These facts demonstrate conclusively the necessity of including the spaces from which teeth have been removed in the X-ray examination.

Radiography and Surgery

The intimate relationship between radiography and surgery need not be discussed at length. Winter,¹¹ Mead,¹² Cogswell¹³ and other authorities in exodontia have placed proper emphasis on the importance of accurate radiographic records.

Only a few of the many advantages of a periodic radiodontic examination have been enumerated. They, in themselves, are sufficiently important to justify a more general acceptance of the service than prevails at the present time. Unfortunately, many dentists who do recognize the advisability of employing the X-ray are not sufficiently critical of the results they obtain and accept inferior pictures. Frequently, a presumable diagnosis is made on evidence that may be worse than useless. This practice is responsible for the doubt that has arisen in the minds of some patients as to the dependability of radiography in disclosing oral disease.

As well as a consciousness of the place of radiography in dentistry, we must realize that the technical quality of the radiographs deter-

mines their value in diagnosis. Radiography's greatest usefulness will not be achieved until our profession realizes that it demands the same fastidious attention to detail that is a requisite to the best results in other departments of dentistry.

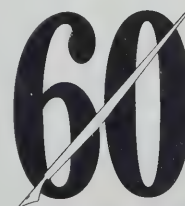
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Diamond Jubilee of Publication

Throughout 1994, the *Journal of the Canadian Dental Association* celebrates 60 years of publication as the authoritative "voice" of dentistry in Canada. Each month, in commemoration of its Diamond Jubilee, the *Journal* will reprint an article from Vol. 1, 1935.

This month's feature, *Radiography in Dentistry*, was written by Dr. James Coupland (1909-1986). Dr. Coupland, a past-president of CDA (1967), graduated from the University of Toronto in 1930 and had a long and distinguished career.





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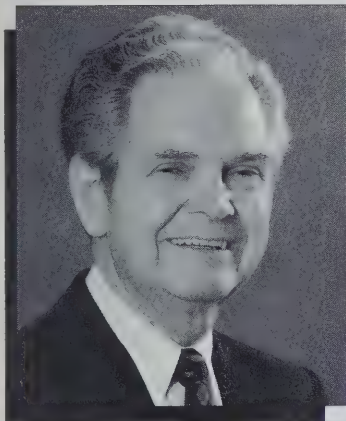
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EDITORIAL

IT'S THE LAW



Dr. P. Ralph Crawford,
Editor

Samuel Johnson, a poet and the author of the *Dictionary of the English Language*, described the law as: "The last result of human wisdom acting upon human experience for the benefit of the public." Perhaps he was ahead of his time. Even though Johnson lived almost 200 years ago, his words could well have served as the theme of a conference held in Toronto last October.

I was privileged and fortunate, along with 225 other dentists and allied dental personnel, to attend the one-day conference. Sponsored by the continuing education department of the University of Western Ontario, it examined the whole issue of "Ontario Law and the Dentist." My day was well spent. The conference was instructive and informative, offering the type of program that every licensing authority in the country should consider, and every dental health worker should attend.

In fact, the calibre and success of the conference can be measured by a well-understood criterion — attendance. At the end of day — and it was a long day, lasting from 8:30 in the morning until 5:45 in the afternoon — a good three quarters of the conference participants were still in their seats. This was a Friday afternoon on a pleasant day in Toronto, with cottage and lake country beckoning.

It should be of no surprise to anyone that dentistry and the law are intimately entwined. Both involve human endeavor and both rely on human communication.

Not surprisingly, if there was one message that was repeated over and over again during the day, it was the need for communication. Lawyer Scott Ritchie, the first of a dozen outstanding speakers, put the conference's theme in perspective when he said, "Mystique falls apart with effective communication and commonsense."

What a world this would be if effective communication and commonsense reigned supreme. And why should the dental office be anything except a microcosm of the real world.

Speaker after speaker offered similar advice on communication. For example: Informed consent is a reasonable dentist disclosing what a reasonable patient would want to know and should know. And it is reasonable that where a procedure involves a life-threatening risk, no matter how remote, then that risk must be disclosed.

Not that the concept of reasonableness is new. Sir Edward Coke, the eminent jurist of the 16th century and the first Lord Chief Justice of England, may have been the first to proclaim it: "Reason is the life of the law; nay, the common law itself is nothing else but reason. The law, is perfection of reason."

Mr. James MacMillan, administrator of the Royal College of Dental Surgeons of Ontario's professional liability program, referred to another aspect of communication — record keeping: "The successful requirements for a defence of a claim are records, records, records."

Little sympathy was given to dentists who keep sloppy records. In fact, if a court of law determines that a practice's record keeping has been inadequate, the judgement usually goes against the dentist.

Mr. Macmillan also reminded dentists that if their dental skills get them into trouble, they shouldn't expect their lawyer's legal skills to get them out of it. With tongue in cheek, he told his audience that it wasn't always a level playing field. "Remember, you are only 6,000 den-

tists, and there are 18,000 lawyers out there!"

Scarcely an aspect of the law was left untouched by the time the conference came to a close. Ms. Tracey Tremayne-Lloyd, who has broad experience in medical and dental law, dealt with the dentist's role as an employer. She emphasized the need for dentists to keep good records and to engage in frank, open communication, stating that this tenet must be followed regardless of whether dentists are dealing with contracts or termination.

Lawyer Harvey Strosberg outlined the case of the Hamilton dentist wrongfully accused of discriminating against an AIDS patient. The ramifications of this case alone would be of interest to any dental jurisdiction in the country. Not only was the dentist exonerated, but he was awarded costs of \$77,600 — proving that, in this particular case, Charles Dicken's Mr. Bumble was wrong when he said: "The law is a ass, an idiot."

Joyce Harris, who practises law as an advocate before the courts and administrative tribunals in Toronto, addressed the subject of sexual abuse by health care professionals. Her message was very strong and very clear: "Don't, don't, don't!"

Twenty three centuries ago, Aristotle said, "Even when laws have been written down, they ought not always to remain unaltered."

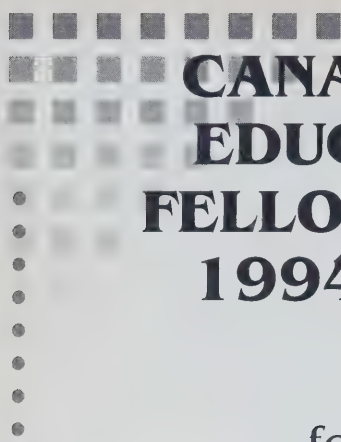
Dentistry has changed over the years. Laws, society and mores have also changed — even more dramatically than dentistry. Despite all the changes, however, the need for laws has never been questioned. Letting go of the law would only result in anarchy and chaos.

Dentists should encourage their associations, societies and licensing bodies to provide periodic updates on the law as it relates to dentistry and their conduct within the dental office. Samuel Johnson was right. Ultimately, the law must be nothing short of human reason acting for the benefit of the public.

P. Ralph Crawford, BA, DMD
Editor of the *Journal of the Canadian Dental Association*

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CANADIAN FUND FOR DENTAL EDUCATION NOW ACCEPTING FELLOWSHIP APPLICATIONS FOR 1994/1995 ACADEMIC YEAR

CFDE Fellowships for Teacher/Researcher Training

To be eligible, candidates must be Canadian citizens or permanent residents who have completed an undergraduate course in dentistry, a dental hygiene program, or a program in science, and qualify for admission to a graduate or other advanced education program.

Applicants must declare their firm intention to become a teacher and/or researcher in a Canadian Faculty of Dentistry or Allied Dental Health Training Program. The minimum requirement consists of two years full service to an institution for each year of Full Fellowship support or two years half-time service to an institution for each year of Half-Fellowship support.

CFDE fellowships are not tenable in addition to another major award.

Warner-Lambert Sponsored Fellowships for Existing Teachers

Three individual Canadian Fund for Dental Education fellowships, sponsored by Warner-Lambert Canada and valued at \$2,500 each, are offered annually to a:

- university dental teacher
- dental hygiene teacher or community health dental hygienist
- dental assisting teacher

Purpose

These awards provide established teachers with the opportunity to pursue studies in their individual field of dental education or research. These fellowships support non-degree programs of relatively short duration and are not intended for those on sabbatic leave. Conventions and similar events are not considered appropriate programs of study within the terms of fellowship.

Eligibility

Candidates must be a full-time member of the teaching staff of a Canadian dental faculty, school of dental hygiene or dental assisting, with a minimum of five years university or community college teaching experience; or a community health dental hygienist engaged in an institution or public health setting with a minimum five years experience in community health dental hygiene.

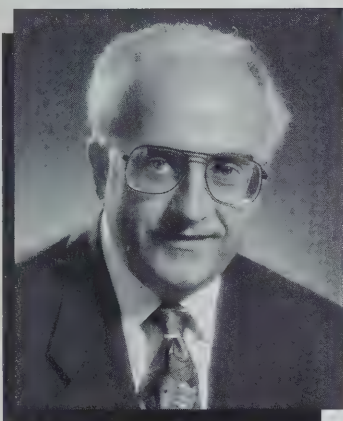
All applications are reviewed by the CFDE's Advisory Committee on Fellowship Selection and recommendations are made to the Fund's Board of Trustees. The winner of each award will be announced after the Board's annual meeting in May.

Applications for each of the above fellowships may be obtained by contacting: the Canadian Fund for Dental Education, 1815 Alta Vista Drive, Ottawa, Ontario K1G 3Y6, (613) 731-0493.

Deadline for application is March 1, 1994.

PRESIDENT'S COLUMN

BUILDING A STRONG FUTURE



Dr. Raymond Wenn,
President of CDA

In December, Canada's new minister of finance, the honorable Paul Martin, announced that the 1993 federal deficit could reach a whopping \$46 billion, or about \$10 billion more than the deficit target set by the former Conservative government.

Not surprisingly, Mr. Martin didn't waste any time setting up a meeting with his provincial counterparts to discuss possible changes in the federal-provincial funding system. Many economists now believe that the federal and provincial governments have to put all their cards on the table and come up with innovative, even drastic, solutions to cut the costs of Canada's social programs as well as reduce its burgeoning deficit.

As a dentist, however, it is sometimes hard for me to accept that Canada is on the brink of economic disaster. While I am fully aware that the current recession has left many Canadians facing job lay-offs, wage freezes, long-term unemployment and an uncertain future, I also know that many established dentists continue to enjoy financial stability and prosperity.

I've been a dentist for 18 years. Despite the economic downturn, my practice has remained busy, my staff complement has remained constant and I haven't experienced any appreciable decrease in gross or net revenues. Certainly, the recession has affected the mix of patients attending my practice and the frequency of appointments, but it hasn't really had an impact on my bottom line.

But has it had an impact on my profession? Unfortunately, I think that it has. Although established dentists may have fared well all through the economic ups and downs of the '80s and '90s, new graduates and dentists who have only been in practice a short time are having serious financial and career difficulties. Many of these young men and women graduated from school with a high debt load, some are married, and a few even have families to support. All of them are eager to establish a practice and a certain lifestyle for themselves. But for some that hope is waning. Like the Canadian government, they have discovered that getting out of debt and building a sound economic future is easier said than done.

In fact, the reality for new graduates these days is far removed from the lifestyle and prosperity that dentists of my generation have come to enjoy. Many new dentists are forced to accept part-time positions, and many work in two or even three different offices each week. As such, their opportunities to offer a wide range of services to patients are limited, at best.

This is not a healthy situation. New graduates will only develop their proficiency and professional knowledge if they are given an opportunity to practise their skills. These young people are our future — the dental leaders of tomorrow. If dentistry is to remain as strong and vital as it is today, we must make it possible for them to assume that role. Just as Canada must find innovative solutions to resolve its deficit crisis, we must find a way to allow new graduates to enter dental practise with dignity, respect, and a reasonable chance to enjoy the lifestyle they hope to achieve.

Fortunately, dentistry's manpower problems could be a lot easier

to solve than Canada's debt crisis. The answer may lie with established dentists like me, and especially with solo practitioners in their 40s and 50s who have worked hard for 20-plus years and have well-established, successful practices.

Perhaps it's time to ask ourselves some pointed questions about our personal lifestyles and the future of our profession: do we need to work so hard?; how many hours are enough?; is gross income the only measure of success?; would a shorter work week and more holidays make our lives more enjoyable?; in short, is it time to stop and smell the roses?

Most of us would probably answer all these questions with a qualified yes. We'd like to slow down, but we really don't want to see our income drop significantly. But would it? I don't think so, provided that we exploit the inherent value of our practice to its full potential.

Basically, the inherent value in our practice lies in our patient base. All of us are aware of active patients who have either refused a proposed treatment plan or who have accepted a plan but have not followed it through to completion. Our inactive charts are more important still, i.e. those patients who have not been in the office for three to five years. Many of these patients could be reactivated. Think about it — maybe the time has come to take on an associate. By exploiting your practice's inherent value to its full potential, it's more than possible that you could enjoy a more relaxing lifestyle without experiencing any loss of income.

I don't claim to be a practice management expert. My only intent with this column is to generate an awareness of both the problems and the possibilities, and to encourage dentists to start asking questions. Many of the answers to these questions can be found in CDA's unique practice management course, *Taking Care of Business*. Developed for CDA by ExperDent Consultants, the course includes a series of books as well as a day-long seminar. It may not be able to solve all your problems or answer all your concerns, but it's a great place to start.

Raymond Wenn, DDS
President of the Canadian Dental Association

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NEWS UPDATE

Health Canada Seeks Information on Use of Pacifiers

The Product Safety Bureau of Health Canada is seeking information on hazardous incidents associated with pacifiers. An information notice released October 25, 1993, warned the public that:

In a recent incident, a 20-month-old child choked on a Panda SUGA orthodontic pacifier. Although the child was not seriously injured, the distributor has withdrawn both the Panda and the Bear SUGA orthodontic pacifiers from sale.

When a baby chews on a pacifier, the handle, the guard or the entire pacifier can get stuck inside its mouth and could get lodged in the throat. Health Canada recommends the use of a teething toy when a child begins to chew.

Consumers who have experienced similar problems with any type of pacifier are requested to contact the nearest office of Health Canada and provide details of the incident.

Further information may be obtained by calling Georges Desbarats, Health Canada, (819) 953-0950. ■

CDA Responds to Saturday Night Article on Amalgam

CDA has written to *Saturday Night* to express its concerns over the magazine's apparent failure to seek comments from dental leaders before publishing an extensive article on mercury amalgam. The article, entitled "Dental Flaws," appeared in *Saturday Night*'s November issue. In a letter to John Fraser, the editor-in-chief of the magazine, CDA president Dr. Raymond Wenn said:

I am writing to you about the article written by Morris Wolfe on "Dental Flaws" appearing in the November 1993 issue of *Saturday Night*.

The Canadian Dental Association has always encouraged productive and informed dialogue with the

Missing Child

The Missing Children's Network of Canada has requested the *Journal's* assistance in locating Adam Croote. The five-year-old child has been missing from Dormansville, New York, since February 1992 and may be living in Canada. He is listed as missing in the RCMP's Missing Children's Registry.

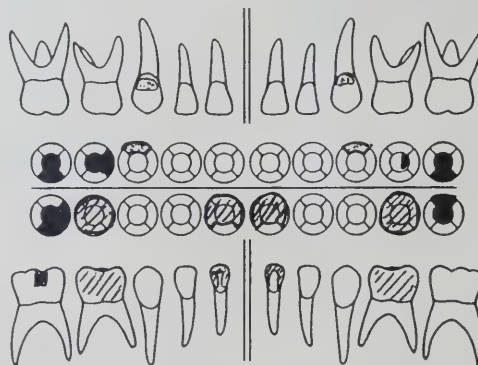
Adam Croote's dental record indicates treatment that is both extensive and unique for a child his age, with particular reference to the two open-faced stainless steel crowns on the mandibular central incisors.

Anyone having information on this missing child should contact The RCMP Missing Children's Registry at (613) 993-1525, or The Missing Children's Network at (514) 843-4333. ■



Above: Adam Croote has been missing since February, 1992, and may be living in Canada.

Below: The missing child's dental chart, indicating extensive and unique treatment for a child his age.



AMALGAM - ■

COMPOSITE/ACRYLIC - ▨

STAINLESS STEEL - ▨

media on all oral health issues, and most particularly those issues that may cause patient concern. To our knowledge, at no time during the development of this article was CDA approached for comment or input, even though we were referenced on a number of occasions in the article, as was our *Journal* editor, Dr. Ralph Crawford. To avoid providing us with the courtesy of a direct comment only reinforces the impression that the media is not much interested in balanced and fair journalism, but only that which conveys a simplistic viewpoint in support of a "scare story" that will increase readership and circulation.

To imply that the profession has been negligent on this issue is both unfair and untrue. Contrary to the

conclusions in the article that the dental establishment in Canada adopted a siege posture on this issue, it has always been the position of CDA to actively encourage and support research on the question of toxicity of dental amalgam. We do this notwithstanding our belief that significant evidence of patient risk associated with the use of mercury amalgam has not been demonstrated.

Interestingly, the article also implies that it is in the self-interest of the profession to be protective concerning the continued use of dental amalgam. Just the opposite is true; the dental profession, in fact, would benefit financially if mercury amalgam was no longer used and fillings

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Hello Patterson.

Goodbye Healthco.

Patterson Dental, **THE LARGEST AND LEADING** dental dealer in North America has completed the acquisition of Healthco Canada.

For Canadian dentists, this means much more than a change in ownership.

It means a **NEW HIGH STANDARD** of service performance.

It means new distribution technologies not previously available in this country. For example, in the near future you will be able to order your requirements directly from a computer terminal in your own office through REMO, our remote order entry system — or with PDXpress, our bar code scanning system.

It also means **NEW COST BENEFITS** for you from a company with vast purchasing power: an organization with \$340 million (U.S.) in sales, 1,800 employees and 85 locations.

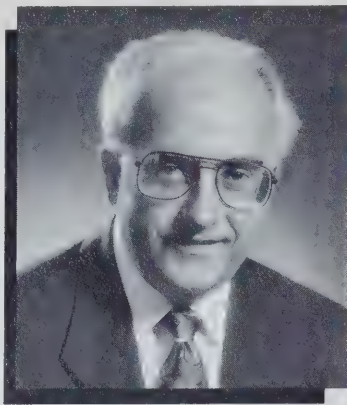
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Dr. Raymond Wenn

were replaced with another material.

In addition, CDA acknowledges that most therapeutic materials involve potential side effects as well as benefits, and that dentists should always be on their guard for these types of reactions with their patients. We encourage open and honest dialogue between dentists and patients on all aspects of dental treatment. It distresses us that Mr. Wolfe and *Saturday Night* would conclude otherwise, and we will certainly use the examples cited in your article to encourage our members to be vigilant in communication with patients on all aspects of oral health care.

The Canadian Dental Association has always responded in an open and responsible fashion to media inquiries, and has encouraged the reporting of accurate and timely articles that will inform the public about oral health care issues. To have been overlooked in this process, and yet at the same time be negatively referenced in your materials, is not what we would expect from a magazine that prides itself on a long history of responsible journalism. ■

Nordic Dentists Express Opinions on the Safety of Amalgam

A report published in the October 1993 issue of *The Dentaletter* reveals that 80 per cent of Nordic dentists consider the risk of side effects from dental amalgam use to be extremely low. In addition, the survey found that most dentists will continue to use amalgam until a better restorative material is found.

The full text of the *Dentaletter* article states:

The safety of amalgam and other restorative materials has caused concern among dental patients in recent years.

The aim of this study was to obtain information on dentists' perceived competence in handling different filling materials and their opinions on the safety of these. A random sampling of practising dentists in Denmark, Finland, Norway and Sweden were sent questionnaires in the mail and answers were received from 65 per cent.

The study showed that the respondents believed that their theoretic knowledge and clinical skills were generally at a high level regarding restorative materials. The risks of the side effects of gold, ceramics, and glass ionomers were considered to be low by about 90 per cent of the respondents.

Amalgam was considered to have a low risk of side effects by about 80 per cent of the respondents in general but only about 60 per cent of the respondents from Sweden, and composite was considered to be associated with a high risk of side

effects by about 50 per cent of the respondents. This was interesting since composite is often regarded as an alternative to amalgam.

Against the background of the present lack of scientific evidence on the hazardousness of amalgam to patients' general health, these findings indicate that dentists are influenced by discussions in the mass media about dental treatment.

Objectively, detectable side effects caused by dental materials are estimated to be few: incidence rates of 0.05-0.1 per cent have been quoted in the literature, however, this is not reflected in the debate in the mass media.

Although it is felt that the use of amalgam will certainly be reduced gradually for general environmental reasons, today, amalgam is still considered to be the best material for restoring medium-sized lesions in posterior teeth; it is durable, unlikely to damage pulpal tissues, cheap, and technically easy to handle.

Few dentists were shown to be concerned about occupational risks associated with the use of amalgam, and they had not had their own amalgam fillings replaced. Nordic

Estonian Dentists visit CDA



Five prominent Estonian dentists paid a visit to CDA's Ottawa headquarters last month as part of their two-week tour of Canadian dental education facilities. Posing with Mr. Jardine Neilson, CDA's executive director, are Dr. Malle Reet Ryan; Dr. Sirje Maria Pihlakas, the assistant director of Tallinn Dental Clinic; Dr. Edvitar Leibur, the head of the department of stomatology and vice-dean of the faculty of medicine at the University of Tartu; Dr. Pilvi Keerne, the director of the Johvi Dental Clinic; and Dr. Maaja Voll, the director of the Parnu Dental Clinic.

The Estonian group's tour included the University of Toronto's dental faculty, Seneca College's program for dental hygiene and dental assisting, Mount Sinai Hospital, the Toronto Academy of Dentistry winter clinic, and a number of private dental practices in Ontario.

dentists were prepared to continue to use amalgam as one of several dental restorative materials while waiting for technically and biologically more satisfactory ones. ■

E. Widstrom et al, Scand. J. of Dent. Res. 1993; 101, p. 238-42.

(Special thanks to the **Dentaletter**, October, 1993)

Toronto Team Wins "Calnor Cup"

No, this isn't the farm team for the Toronto Maple Leafs. It's the Toronto Buds, the 1993 winners of the 7th annual Dental/Medical Hockey Tournament.

The Buds were one of eight teams from across Canada to play in the tournament, which was held in Scottsdale, Arizona, November 10-14. Until 1989, only dental teams donned their skates and pads to compete for the Calnor Cup. Both dental and medical teams now participate.

Conceived by Calgary dentists Drs. Tally Abougoush and Joey



The Toronto Buds, front, l to r: Drs. Brian Denyar (graduate of McGill University), Don Ducasse (U of T), Ed Shure (U of T), Al Camastra (U of T), Peter Culp (U of T), Kris Row (Manitoba). Standing: Bruce Pritchard (U of T), Jim Bonar (Manitoba), Lorne Acheson (Manitoba), Karl Vermeulen (U of T), Mike Todd (U of T), John Perry (Manitoba), Alan Milnes (U of T).

Brown, the annual tournament is organized by Calnor Group Tours. For more information on the event, contact John Tabachniuk of Calnor Group Tours at: 403-299-1786.

In addition to the tournament, dentists may wish to participate in a dental/medical seminar, take advantage of nearby golf courses, or see an NBA or NFL game. ■

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This exciting career opportunity will appeal to Dentists interested in assuming the challenges of a Chief Executive Officer position. Through a staff of seven, the selected individual will be responsible for the overall operation and management of the Association, including: office administration, membership services, government relations, and communications.

Competitive candidates will be Dentists licenceable in the Province of Alberta, with at least 10 years experience. Excellent management, administration, interpersonal and communication skills are required.

Rewards include a competitive salary and benefits program, the opportunity to be an important resource to the President and Board of Directors, and to contribute extensively to the profession. To enquire further, please telephone or forward a resume of related accomplishments, in complete confidence, to:

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Let the tooth be told.

More than five million Canadian adults suffer from tooth sensitivity. Surprisingly, more than half are between 25 and 44 years of age.

There are many reasons for tooth sensitivity. Poor oral hygiene, improper toothbrushing, high consumption of acidic beverages and gum recession are just a few. Whatever the cause, tooth sensitivity often goes undiagnosed.

Despite the irritating discomfort, few sufferers discuss or ask about tooth sensitivity during routine check-ups.

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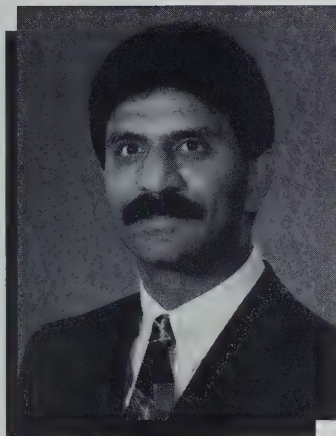


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Taking Notes from the Corporate World: How Re-engineering is Revolutionizing Businesses

Imtiaz Manji, B.Sc.

President of ExperDent

By now, you've probably heard the latest management buzz word being tossed around in corporate boardrooms across North America. No, it's not downsizing, restructuring, flattening, or delayering. Nor is it a euphemism for these management colloquialisms. The current catchword is re-engineering, a term coined by Michael Hammer and James Champy, co-authors of *Re-engineering the Corporation: A Manifesto for Business Revolution*.

Re-engineering thrust itself into the business community in 1993 and is set to soar into the public domain with even more of a vengeance in 1994. That said, you're probably wondering what's different about the concept of re-engineering that makes it distinct from the other popularized managerial terms. And more pointedly, what application, if any, does it have beyond the confines of the mega-corporations — IBM Credit, Ford Motor, and Kodak, for example — who are embracing its principals?

In fact, although re-engineering may be in its infancy, its track record to date suggests that it is a pioneering concept that could dramatically alter the way North American corporations conduct their business activities. But its impact is unlikely to end there. As

with many management trends, small businesses will let their corporate "big brothers" test the waters with re-engineering and, if it works, borrow the concept and reconstruct it for their own purposes. Dentists, as small businessmen working in an ever-present, dynamic management maze, should be all eyes and ears.

What is Re-engineering?

The formal definition of re-engineering, as conceived by Hammer and Champy, is: "the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service, and speed." Put simply, re-engineering is about starting over. It's about examining what we do and asking ourselves what work is required to produce a product or provide a service that holds value for the customer.

Questioning the very nature of why they're in business and why their business operates in a certain way is the sort of fundamental corporate navel-gazing to which some businessmen are unaccustomed. It demands an abandonment of the basic assumptions that have guided the organizational structures of companies for nearly 200

years, in particular the specialization of labor, which was first outlined by the economist Adam Smith in his 1776 seminal work *The Wealth of Nations*. It was Smith who concluded that a pin factory's production could be dramatically increased if its workers were specialists rather than generalists (i.e., if each worker completed a single step in the production of a pin instead of completing each step in its production).

Smith's principles certainly worked — in their time. But that time is past. The so-called pin factory approach is no longer applicable to the complexities and competitiveness of today's market. Because the business equation has changed in myriad ways, from rapid technological advancements to fluctuating market demands, businessmen must adapt to the new realities in a dramatic and radical fashion. Resisting these changes won't make them go away, but it will fast track diehard traditionalists into economic oblivion.

The main thrust of Hammer and Champy's re-engineering concept concerns the processes followed by an organization. In many companies, the focus of the workers is on their individual tasks, i.e., the part they play in producing the

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"pin" or its equivalent. This makes workers task-oriented rather than results-oriented. But there is no value in the individual tasks performed by workers if the desired result of the process — getting a quality "pin" to the customer — is not achieved. Re-engineering demands a major mind shift, from letting go of the focus on tasks to embracing a results-driven approach.

The Forces at Work

We've already suggested that being successful in business today — and as we approach the next millennium — will require businessmen to venture into uncharted territory and embrace new methods. But there are specific forces at work that have facilitated this new order, forces that re-engineering not only considers but comprehends. Hammer and Champy call these the three Cs — customers, competition and change. An understanding of each of these forces is imperative to any business redesign.

Customers

Whether companies recognize it or not, the profile of customers today is not what it was, say, in the decades following the Second World War. Back then a shortage of consumer goods gave existing suppliers a definite advantage. They produced the needed goods and sold them with relative ease. But beginning in the early '80s, that dynamic changed. With the economic growth of the '80s, the buyer had several sellers to purchase from and, as a result, became increasingly choosier in his or her selection of goods and services. The companies that recognized the shift toward a closer buyer-seller relationship — a phenomenon that is growing even more prevalent today — responded appropriately. These firms know that they must meet the particular demands of each customer (be it in quality, price, selection or service) in order to keep that customer happy. Consumers have become all-powerful, and their behavior indicates that they are far from timid in exerting their strength. If they're not getting

what they want, they'll look elsewhere — and likely find it.

Keeping customers happy starts by looking at each one as an individual with particular tastes, and not lumping them together as a "market." Technology can help businessmen to succeed in this area.

Hammer and Champy's book illustrates the lengths to which companies routinely go to "get a handle" on their customers: "In the service sector, consumers expect and demand more, because they know they can get more. Technology, in the form of sophisticated, easily accessible databases, allows service providers and retailers of all kinds to track not only basic information about their customers, but their preferences and requirements, thereby laying a new foundation for competitiveness.

"In Houston, if a customer calls Pizza Hut to order a pepperoni and mushroom pie, the same kind of pizza that the customer ordered last week, the clerk asks if the caller would like to try a new combination. If the person says "yes," the clerk mails him or her discount coupons with offerings customized to that individual's tastes. When a consumer calls Whirlpool's service line, the call is automatically routed to the same service representative with whom the consumer spoke last time, creating a sense of personal relationship and intimacy in a world of 800 numbers. Mail-order retailers, which have the capability of collecting enormous amounts of data about their customers, have perfected an even higher targeted level of service. Once customers experience this superior service, they do not happily return to accepting less."

Competition

Virtually all businesses recognize the fierce competition that exists in today's market. For megacorporations that do business worldwide, globalization is sometimes bittersweet, however. The lifting of trade barriers widens their market, but also opens up opportunities for the competition to invade their territory. If they're not able to provide superior quality goods, service,

and price, they'll likely shut the doors on their own businesses.

An interesting point to consider is the relationship between established companies and upstarts. Long-time competitors typically keep watchful eyes on each other, believing that they know where their potential threat lies. However, they often neglect to identify those new, aggressive, creative companies that may just elevate the threshold of competitiveness to unimaginable heights. (One example offered by Hammer and Champy is the success of the U.S. retailing giant, Wal-Mart, which refused to model itself after the existing competition, Sears. Instead, Wal-Mart, "reinvented retailing.")

Change

Yes, that old adage about change being the only constant is true — and becoming more so all the time. The problem with most businesses today is not that they don't respect this truism, but that they view it narrowly. Many companies take a good look at the market and the competition, and then factor any changes that may affect them into their organizational equations. They also prepare themselves to respond quickly to these changes, be it by developing an innovative product or by integrating the latest technology into their organization. However, very few consider unanticipated changes, and it is these changes that are the most pervasive. Another excerpt from *Re-engineering the Corporation*, demonstrates this point:

"The brand managers at a consumer goods manufacturer...assiduously tracked consumer attitudes in order to detect shifts that might affect their products. Their surveys kept giving them good news, but market share took a sudden drop. They did more surveys. Customers loved the products, but market share kept tumbling. It turned out that the company's sloppy order fulfillment process was infuriating its retailers, who responded by cutting the products' shelf space, but neither the brand managers nor anyone else at the company had a broad enough per-

spective to detect and deal with this problem."

The Hallmarks of Re-engineering

What does a re-engineered business look like? How is its new incarnation different from its previous form? In re-engineered companies, new values prevail: employees are empowered, accountable, flexible and results-driven; jobs are multi-dimensional; compensation is based on results rather than activity; success is a collective/team effort. All processes flow from the implicit understanding that the customer is actually the boss, and that pleasing them is the company's *raison d'être*.

Next month, we'll examine re-engineering in more detail, and consider how it can be put to work for you in the dental office. ■

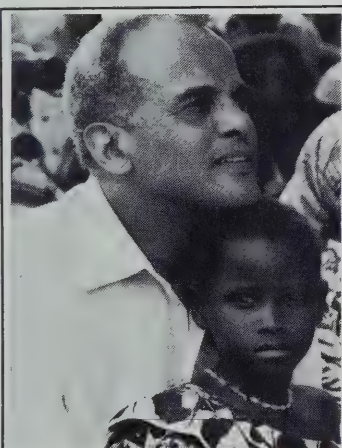
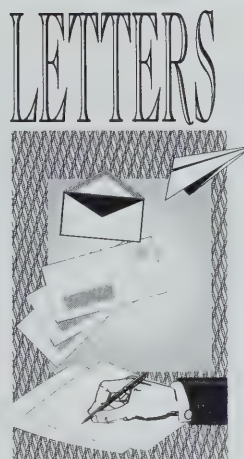
LETTERS

Imagine — The Spirit of Giving

Nearly 40 per cent of Canadians have heard of IMAGINE, the education program that talks about the importance — and the benefits — of giving time and money to community causes. We want to thank the Canadian Dental Association for its generous support in donating public service advertising space to IMAGINE.

IMAGINE ads ask Canadians to give time and money to the charitable and voluntary causes they believe in. Whether someone coaches the neighborhood little league team, or gives money to a major health organization, they are doing their part to "help change the world, one act at a time."

Julia Gorman
Manager, IMAGINE
Public Program
Toronto, Ontario



— Harry Belafonte
UNICEF Goodwill Ambassador

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This does not constitute an offering of securities. Reference should be made to the offering memorandum.

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CDA LIBRARY

What's New In the Library This Month?

This month's package library features a series of articles on tooth erosion. It is available to CDA members at a cost of \$5 (plus applicable taxes).

To obtain your package, call the CDA Library at: 1-800-267-6354 or 613-523-1770. You can also place your order by fax, at: 613-523-6574. The articles included in this month's package were located through a MEDLINE search. Dentists wishing to locate articles on specific topics should call the library to arrange for their own personalized literature search. This unique service is provided free to CDA members. Articles located in a search are available to dentists at a fee of \$7 for the first 10 articles, plus \$0.10 for each additional page. Articles that are not available in the CDA Library, but that can be obtained through an inter-library loan, are available at a cost of \$7 each. Call the CDA Library for more details.



Tooth Erosion

1. Cataldo, E. and Santis, H.R. "A clinico-pathologic presentation. Tooth erosion." *J Mass Dent Soc*, 1991; 40(2):53, 86.
2. Cubbon, T. and Ore, D. "Hard tissue and home tooth whiteners." *CDS Review*, 1991; 84(5):32-5.
3. Galan, D. "Clinical application of Geristore glass-ionomer restorative in older dentitions." *J Esthet Dent*, 1991; 3(6):221-6.
4. Gedalia, I. et al. "Enamel softening with Coca-Cola and rehardening with milk or saliva." *Am J Dent*, 1991; 4(3):120-2.
5. Hansen, E.K. "Five-year study of cervical erosions restored with resin and dentin-bonding agent." *Scand J Dent Res*, 1992; 100(4):244-7.
6. Harrison, J.L. and Roeder, L.B. "Dental erosion caused by cola beverages." *Gen Dent*, 1991; 39(1):23-4.
7. Jarvinen, V. et al. "Location of dental erosion in a referred population." *Caries Res*, 1992; 26(5):391-6.
8. Jordan, R.E. and Suzuki, M. "Early clinical evaluation of four new bonding resins used for conservative restoration of cervical erosion lesions." *J Can Dent Assoc*, 1993; 59(1):81-4.

9. Larsen, M.J. "On the chemical and physical nature of erosion and caries lesions in dental enamel." *Caries Res*, 1991; 25(5):323-9.
10. Lussi, A. et al. "Dental erosion in a population of Swiss adults." *Comm Dent Oral Epidemiol*, 1991; 19(5):286-90.
11. Mahonen, K.T. and Virtanen, K.K. "An alternative treatment for excessive tooth wear. A clinical report." *J Prosthet Dent*, 1991; 65(4):463-5.
12. Mair, L.H. "Wear in dentistry — current terminology." *J Dent*, 1992; 20(3):140-4.
13. McIntyre, J.M. "Erosion." *Aust Prosth J*, 1992; 6:17-25.
14. McLundie, A.C. "Localised palatal tooth surface loss and its treatment with porcelain laminates." *Res Dent*, 1991; 7(2):43-4.
15. Nash, R. "A predictable restorative Class V erosion technique." *Practical Periodont Aesthet Dent*, 1991; 3(2):39-42.
16. Nawabi, S. and Freidank, W. "Porcelain onlays in restoration of vertical dimension." *Gen Dent*, 1991; 39(1):25-7.
17. Palmer, D.S. and Nitola, F.M. "Interim treatment of a patient with eroded maxillary dentition: a clinical report." *J Prosthet Dent*, 1992; 68(5):721-3.

18. Powell, L.V. et al. "Clinical evaluation of direct esthetic restorations in cervical abrasion erosion lesions: one year results." *Quintessence Int*, 1991; 22(9):687-92.

19. Reid, J.S. et al. "The treatment of erosion using porcelain veneers." *ASDC J Dent Child*, 1991; 58(4):289-92.

20. Roessler, D.M. "Amalgam and composite resin as an alternative to crown and bridgework in the rehabilitation of an extensively debilitated dentition. Case report." *Aust Dent J*, 1991; 36(1):1-4.

21. Smith, B.G. "Some facets of tooth wear." *Ann R Australas Coll Dent Surg*, 1991; 11:37-51.

22. Taylor, G. et al. "Dental erosion associated with asymptomatic gastroesophageal reflux." *ASDC J Dent Child*, 1992; 59(3):182-5.

23. van Dijken, J. "Three-year evaluation of effect of surface conditioning on bonding of glass ionomer cement in cervical abrasion lesions." *Scand J Dent Res*, 1992; 100(2):133-5.

Recent Acquisitions

The following texts have been received by the library, and may be borrowed by CDA members at a cost of \$5, shipping and handling included.

1. Levine, S. *Subject index of the higher degree and diploma theses of the Faculty of Dentistry, University of Sydney : 1928-1991*. Univ. of Sydney : c1991.
2. Miles, D.A. and Van Dis, M.L., guest eds. *Advances in dental imaging*. Saunders : 1993.
3. Taylor, T.D. and Laney, W.R. *Dental implants : are they for me? Quintessence* : 1993.
4. United States. Dept. of Health and Human Services. Public Health Service. National Institutes of Health. National Institute of Dental Research programs: fiscal year 1991 funds. The Institute : 1991.

The Dentistry Canada Fund

New Fund Coordinates Dental Giving

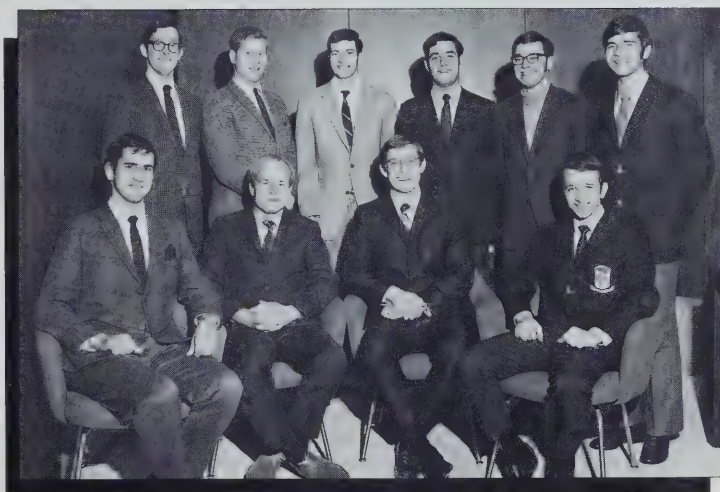
P. Ralph Crawford, BA, DMD

A new national charity for dentistry, **The Dentistry Canada Fund**, has been launched to administer four existing charities concerned with raising funds in support of a range of dentistry-related activities, including dental research and education in Canada.

On January 1, the overall responsibility for fund raising, the distribution of funds and the administration of CDA's current dental charities — the Canadian Fund for Dental Education (CFDE), the Canadian Dental Foundation (CDF), the Canadian Dental Research Foundation (CDRF) and the Grieve Memorial Lectureship Trust — was assumed by the Dentistry Canada Fund. The unique objectiveness of each of the four charitable groups will be maintained under the new integrated administration and management structure.

It is anticipated that the integration of fund-raising efforts under the Dentistry Canada Fund will streamline the administration of dental giving, allowing CDA's dental charities to accomplish more for dental research and education than was possible under the previous structure. Prior to this year, CDA's dental charities were administered and managed independently.

Besides assuming the administrative responsibility for CDA's dental giving programs, the Dentistry Canada Fund has a mandate to widen dentistry's charitable do-



Ten students from nine Canadian dental faculties participated at the first Canadian Dental Students Conference, held in Toronto November 20-22, 1969. The event was sponsored by CFDE.

nor base, as well as to provide more options with respect to the types of programs that donors may designate for support. A menu of choices has been developed to offer donors more options for their contributions.

Grieve Memorial Lectureship Trust

The lectureship was established in 1950 as a memorial to Dr. George Wellington Grieve, who at the time of his death in 1950 was recognized as the dean of Canadian orthodontics.

A 1899 dental graduate of the University of Toronto, Dr. Grieve took his specialty training at the Angle School of Orthodontics in 1908. He was an original thinker and undoubtedly a leader in his profession. It was Dr. Grieve, for example, who advocated the removal of teeth prior to undertaking corrective orthodontic treatment — treatment that was quite unorthodox in itself in the early 1920s.

The income from the trust is used to help defray the costs of the Grieve Memorial Lecture, which is presented each year at CDA's Annual Dental Meeting.

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Dr. George Wellington Grieve,
1877-1950.



Dr. Sydney Wood Bradley,
1879-1967. CDA president, 1924.



Helen Margaret Langstaff (Bradley),
1912-1985.



Dr. Frederick Gollop, 1897-1984

Canadian Fund for Dental Education (CFDE)

Established in October 1962, CFDE has provided almost \$4 million in funds for needy students, grants to dental faculties, teaching conferences, dental students' conferences, teacher training fellowships and many other worthy programs. CFDE comprises a general fund and 18 individual endowment and developing funds with specific distribution mandates.

Canadian Dental Foundation (CDF)

CDF, established in October 1988 under the Canada Corporations Act, consists of two trusts, the Library Trust Fund and the Dr. Frederic Gollop Bequest.

The Library Trust Fund was established in 1950 through the generosity of Dr. Sydney Wood Bradley, an Ottawa orthodontist and CDA past-president (1924). When Dr. Bradley passed away in



The 1993 Canadian Dental Research Foundation Award recipient, Dr. Guy Gagnon (left), with Dr. Roland Vallée, director of the faculté de médecine dentaire, Université Laval, where Dr. Gagnon carried out his research.

1967, his bequest of \$50,000 allowed the CDA Library to flourish and it was subsequently named in his honor. In 1986, the Sydney Wood Bradley Memorial Library's future was affirmed when Dr. Bradley's only daughter, Mrs. Helen Langstaff, bequeathed the magnanimous sum of \$1.3 million to the trust.

The other trust under CDF is the Frederic Gollop Bequest. Dr. Gollop, a 1920 graduate of the University of Toronto, practised in Ottawa as a general dentist for more than 50 years. He lived a lifetime of professional dedication, and it was this special characteristic that prompted him to make a bequest to CDA toward the "well being of the profession."

The Canadian Dental Research Foundation Trust (CDRF)

CDRF had its genesis as the Canadian Dental Research Memorial Fund. It was established in 1920 by a group of dedicated dental professionals as a memorial to the dentists who served in the First World War.

The trust's original terms of reference are as relevant today as they were 70 years ago: "To carry out intensive study of perplexing problems and to give assistance to members in their efforts to find satisfactory solutions. To give financial or other assistance to worthy members as may be struggling with great problems and making sacrifices far beyond their means."

CDRF has been administered by CDA since March 1979, and offers a biennial award to encourage dental research by graduate or postgraduate dental students in Canada.

Seven Ways to Show You Care

With the establishment of the Dentistry Canada Fund, there are now seven ways in which members of the dental community can show they care about the advancement of their profession.

- an annual unrestricted contribution
- a donation to a special endowment or developing fund, according to a menu of choices
- a living memorial gift honoring the memory of a friend, colleague or loved one
- a tribute gift to mark all the important events in the lives of those close to you
- a bequest in your will
- a personal endowment, now or in your will, for the benefit of dental health in perpetuity
- a contribution through the new planned giving program.

For more information on how to contribute to the Dentistry Canada Fund, write Ms. Julie Hentschel, DCF fund administrator/coordinator, 1815 Alta Vista Drive, Ottawa, Ontario K1G 3Y6, or call (613) 731-0493, or send a fax to (613) 523-7489. All contributions are tax deductible.



ORAL & MAXILLOFACIAL RADIOLOGISTS

(2 POSITIONS)

UMDNJ - New Jersey Dental School seeks two Oral and Maxillofacial Radiologists for full-time tenure-track appointments in the Department of Oral Pathology, Biology and Diagnostic Sciences. The successful candidates will be members of the Division of Oral and Maxillofacial Radiology with responsibilities for predoctoral and graduate teaching; independent or collaborative clinical or basic research; and advanced clinical imaging through participation in an intramural faculty practice. The Division of Oral and Maxillofacial Radiology is in a reorganization and growth phase. In addition to faculty recruitment, we are initiating a clinic renovation and modernization to include advanced imaging and clinical research space, and are hiring additional support staff. The Division seeks candidates who are interested in contributing to an expansion of research and patient care activities directed to the development and initiation of a postgraduate program in Oral and Maxillofacial Radiology.

Requirements include a DDS/DMD from an ADA-accredited school, licensure in New Jersey or a willingness to obtain such license, and advanced education in oral and maxillofacial radiology. Certification by or eligibility for the American Board of Oral and Maxillofacial Radiology is highly desirable. Preference will be given to candidates with a demonstrated ability to conduct research.

One position is available immediately, the second will be available July 1, 1994; however, the search will remain open until the positions are filled by qualified candidates. Salary and academic rank commensurate with background and experience. Letter of interest and curriculum vitae should be sent to Dr. Mel L. Kantor, UMDNJ-New Jersey Dental School, 110 Bergen Street, Room C-827, Newark, New Jersey 07103-2400. UMDNJ, NJ's university of the health sciences, is an Affirmative Action/Equal Employment Opportunity Employer, m/f/h/v, and a member of the University Health System of New Jersey.



Get Your Broom Ready for the Mid-Winter Bonspeil!

The Western Canada Dental Society will hold its
26th Annual Mid-Winter Meeting and
Bonspeil in Winnipeg, Manitoba,
March 10-12, 1994.

Annually, between 32 and 48 teams meet
for friendly competition in one of the
seven major cities in Western Canada.
1994 is Winnipeg's year to serve as the
host city. Dentists from across Canada
are welcome to participate.

To obtain more information, contact:

Dr. Ted Derrett, 1994 Chairman
Western Canada Dental Society
103-698 Corydon Avenue
Winnipeg, Manitoba, R3M 0X9
Phone: (204) 453-0055

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CDSPI 35 Years Later: Organized Dentistry's Baby Matures

Canadian Dental Service Plans Inc. (CDSPI) turned 35 January 9. But unlike some members of the "thirty-something" generation, we've been looking forward to this milestone with pleasure, not dread. Since CDSPI's inception in 1959, we've truly blossomed into a mature service provider that our parent — organized dentistry — can truly be proud of.

Much has happened in the 35 years that we've been providing services to the dental profession. Certainly, dentistry has seen considerable changes. Fluoridation, increased emphasis on home care and sophisticated clinical skills have contributed immeasurably to saving teeth. Back in 1959, it's unlikely that dentists could have imagined present-day techniques such as video imaging, laser surgery and routine implantology.

And as surprising as it may seem with today's stiff competition for practice locations, in the late '50s there was actually a *shortage* of dentists. This forced the profession to adapt quickly in order to meet the growing public demand for dental care. Starting in 1958, five new dental schools were established in Canada, bringing the total number up to the current complement of 10, and an intensive public relations campaign was undertaken to attract qualified applicants to the profession.

As well, over the last 35 years, dentists have become considerably more adept at running a business and being responsive to their patients' needs. Today, most would agree that dentistry is a much more

competitive — but also more exciting and challenging — profession.

The Beginning

As the profession evolved over the years to provide better service to the public, so did CDSPI. The fact that CDSPI was even created 35 years ago is a testament to the responsiveness of organized dentistry to the needs of the profession. CDSPI started with a staff of eight in 1959. In those days we shared

national or provincial insurance plan for dentists. Although component societies in several provinces had arranged group insurance coverage for their members, there was no similarity between the various plans. Dentists moving their practices out of the jurisdiction of their component societies often lost their insurance coverage. Moreover, the plans were not geared to the specific needs of dentists.

The insurance plans that CDSPI administers for CDA and the co-sponsoring provincial associations address these problems. Over the years, they have developed into one of the most comprehensive insurance programs available to any professional group in Canada. At the same time, CDSPI took on more responsibility for serving dentists in other areas — including the administration of a retirement savings plan, the CDA RSP, that provides exceptional value to participants.

Today, CDSPI is housed in an efficient office in Scarborough, Ontario. From here, its almost 50 employees take care of the day-to-day details of administering your insurance and investment plans. We answer your questions about individual programs, process applications, and generally ensure that the programs run as smoothly as possible.

Adapting to the Needs of the Profession

Currently, we administer the Canadian Dentists' Insurance Program (CDIP), the CDA Retirement Savings Plan (CDA RSP) and the CDA Retirement Income Fund (CDA RIF) for CDA and the co-sponsoring provincial associations.



offices with the Royal College of Dental Surgeons of Ontario, the Ontario Dental Association and, for a time, the Toronto Academy of Dentistry. Our original mandate was to provide administration and accounting services to several provincial government posttreatment payment programs that enabled Canadians to receive proper dental care.

However, a few years later, CDSPI was given the added responsibility of administering an insurance program for the profession. Before CDSPI came into being, there was no comprehensive

With CDIP, the CDA RSP and the CDA RIF, dentists get insurance plans and investment products designed with their practice and personal needs in mind. In addition, because the plans are administered under one roof, dentists can take care of most of their insurance and investment needs conveniently and easily in one stop — at CDSPI.

In spite of its successes over the last 35 years, CDSPI isn't resting on its laurels. On behalf of CDA and the co-sponsoring provincial associations, we continually review our range of programs and services, updating them as required, so that they continue to offer the benefits that dentists need and want. As a result, participants can expect continual improvements and additions to the programs we administer.

For instance, late last year, the CDA RIF was introduced to provide dentists closing their RRSPs with a tax-sheltered source of retirement income. This year, CDIP's long-term disability plan gives dentists a 30-, 60- and 90-day waiting period to choose from before benefit payments start. Plus, premiums for the 90-day waiting period are now considerably lower than last year's rates. CDIP's accident insurance also provides broader, specialized coverage for dentists' hands and eyesight, at much lower premiums than in 1993.

In addition, CDSPI makes a concerted effort to be accessible — and to put a human face to our organization — by participating in the national as well as provincial dental association conventions and various regional society meetings across the country.

From our modest beginning in 1959, CDSPI has continually expanded. We now provide a diverse range of quality services and products. Just as the dental profession has responded to changes in patient needs, we have adapted as the needs of dentists have evolved over the years. But one thing hasn't changed — we're still very much your organization — so look forward to the next 35 years of service. ■

CDA RETIREMENT SAVINGS PLAN

Unit values: (Funds are valued weekly)

Fund	Unit values at		12 Month Return %
	November 30, 1993	October 31, 1993	
Bond & Mortgage Fund	11.38944	11.30977	13.8%
Common Stock Fund	23.39536	23.28535	32.7%
Money Market Fund	65.76281	65.54288	6.4%
Balanced Fund	42.74203	42.54320	17.1%

G.I.C. Fund

Term	November 30, 1993	October 31, 1993
1 yr	4.55%	4.80%
2 yr	4.80%	5.20%
3 yr	5.25%	5.85%
4 yr	5.60%	6.10%
5 yr	6.05%	6.35%

(*Rates subject to change without notice.)

Total Assets (market value) of the Plan as of

November 30, 1993	October 31, 1993
\$191,169,265.00	\$191,292,048.00

For further information:



CDSPI

Write:

CDSPI
Retirement Services Dept.
Suite 710
100 Consilium Place
Scarborough, Ontario
M1H 3G8

or phone, toll free:

416-296-9401 Metro Toronto
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more of us
would know what
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BOOK REVIEWS

Medical Emergencies in the Dental Office 4th edition

By S.F. Malamed

1993, C.V. Mosby Co., Toronto
466 pages, 192 illustrations

This is the fourth edition of Malamed's very popular textbook. Published as a soft cover, the book's overall appearance and format are similar to past editions. It consists of four major sections: Prevention, Unconsciousness, Respiratory Emergencies, and Chest Pain and Cardiac Arrest, which are divided into 30 chapters. An appendix of useful algorithms that complement each major section appears at the end of the book, followed by a useful index.

This excellent text incorporates all the author's revisions and updates of essential materials from previous editions. For example, significant changes and simplifications have been made in the design of the emergency drug and equipment list. Many of the revised (1992) American Heart Association guidelines for basic and advanced cardiac life support have also been incorporated into this latest edition.

The author emphasizes stress management for the medically-compromised patient, as well as basic history taking and cursory physical examination. This is not an in-depth physiology or pharmacology text, however, but is instead geared to the general dental practitioner.

Among other things, the book emphasizes that the office emergency kit does not need to be complicated. It presents four levels or modules of drugs and equipment—basic drugs and equipment, non-critical drugs and equipment, advanced life support and, finally, antidotal drugs. The book is referenced throughout the body of the text, and a bibliography that contains updated as well as many classic, older references follows each chapter.

This reviewer agrees with almost all of the book's contents. I was surprised, however, to see no mention of an aerochamber when using a metered-dose inhaler during an acute asthmatic attack, that hydroxyzine was recommended for use in the epileptic patient (which it should not be), and the use of dextrose-containing solutions in patients experiencing loss or altered states of consciousness. (These drugs are now contraindicated in these cases, except, of course, for hypoglycemic-induced unconsciousness.) I also found the book to be repetitive on occasion. For example, the short chapter on acute adrenal insufficiency stated at least seven times that the resting release of cortisol from the adrenal medulla is 20 mg/day!

Despite these minor nuances, this is an excellent text for the dentist or dental student and it will be on our "required list" for undergraduate students.

Reviewed by:

Dr. E.R. Young,
associate professor and head,
department of anesthesia,
faculty of dentistry,
University of Toronto
and the Wellesley Hospital,
Toronto, Ontario.

Esthetic Approach to Metal Ceramic Restorations for the Mandibular Anterior Region

By Klaus Muterthies

1990, Quintessence Publishing Co. Ltd., Chicago
90 pages, color illustrations

Klaus Muterthies is well-known for his innovative approaches designed to produce more esthetic crown and bridge restorations. In this book, he shows in detail the techniques he employs to recreate the subtle variations found in natural dentition in a mandibular anterior bridge. Beginning with framework set up and the pretreatment of metal surfaces, the author runs

through the entire case from start to finish. Each of the step-by-step, easy to follow procedures are described in full and illustrated in one or more of the book's 140 color photographs. Particular emphasis is placed on producing internal characteristics through the build up of the ceramic layers and a new incisal layer build up technique.

The author presents far more than just a technique. In fact, he presents a philosophy based on how to handle shape and space in the natural arrangement of individual teeth. This key concept is rooted in the premise that the shape of the tooth surfaces and characterizations, according to age and type, are more important to the esthetic success of a restoration than color. Natural-looking teeth are obtained through the ideal shaping of each tooth design labially, interproximally, cervically, lingually and incisally. The author also provides an in-depth analysis of the strengths and weaknesses of different metal systems, and how to allow for the special features (and weaknesses) of ceramics.

Dental technicians will find the chapter on ceramic build up particularly interesting, as the author uses a reduced range of materials. His unique technique is fully outlined, covering the application of opaque; build up of dentin material; modelling of labial, incisal and interproximal zones; fabrication of the lingual aspect; incisal characterization and preparation for firing, and further build up. The book concludes with figures selected to show the influences of shape, surface and the position of teeth on esthetics.

In conclusion, this volume illustrates clearly many of the possibilities that can be achieved with modern dental ceramics. As such, it is a valuable reference tool for any dental professional.

Reviewed by:

Mr. H.J. (Hyo) Maier, RDT
President, Aurum Ceramic/
Classic Dental Laboratories Ltd.

A white toothbrush with a blue and white handle and a white head. The neck of the toothbrush is flexible, shown in a bent position. The handle has a blue grip with a textured pattern. The head has dual bristles.

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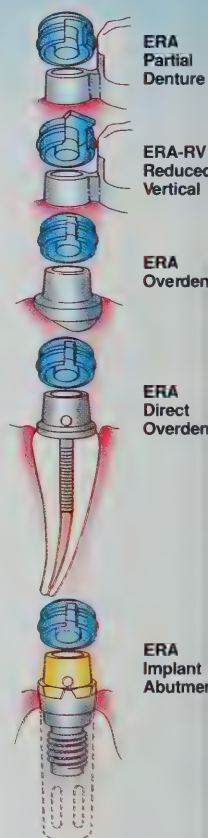
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Ketorolac versus Ibuprofen: A Simple Cost-Efficacy Comparison for Dental Use

Ben Balevi, B. Eng., DDS

As dentists, we are regularly inundated with promotional literature on the newest dental therapies and products. For the most part, this commercial marketing consists of large, four-color, glossy spreads, which typically summarize the efficacy of a product in one or two lines (i.e., the slogan), complemented by convincing graphs and photographs. These marketing methods can be impressive — the recent introduction of ketorolac (Toradol) is a case in point.

Ketorolac is being aggressively marketed to dentists as a "non-narcotic" analgesic that provides "narcotic efficacy without narcotic drawbacks." At first glance, this promotional strategy gives the impression that until ketorolac came on the scene, there was no other "non-narcotic" alternative for the management of acute dental pain. This, however, is not the case.

Ibuprofen (e.g., Motrin, Advil, and Mediprin) is also a "non-narcotic" analgesic with proven "narcotic efficacy," and it has been used for managing moderate to moderately severe dental pain for well over a decade. Ibuprofen is a NSAID (nonsteroidal anti-inflammatory drug) with both anti-inflammatory and analgesic properties.³ Many studies have confirmed its efficacy for relieving post dental surgery pain.¹⁻⁵

Ketorolac is also classified as an NSAID, but it is considered more

for its analgesic qualities than for its anti-inflammatory activity. Two studies investigating the efficacy of a single dose of ketorolac (10 mg) following dental impaction surgery have demonstrated it to be a superior analgesic to the acetaminophen and codeine combination analgesic Tylenol 3.^{6,7} The second study also included ibuprofen (400 mg) as one of the treatment groups. This second study revealed that the clinical efficacy of ketorolac (10 mg) versus ibuprofen (400 mg) was statistically insignificant.⁷

There is no doubt that ketorolac is an effective analgesic. However, for pain incurred during dental extraction, ketorolac and ibuprofen have been shown, scientifically, to be equally potent analgesics. The question that begs to be asked, then, is: are the two drugs available to the patient at a comparable cost?

Table 1 compares the costs of ketorolac (10 mg) with the costs of three available types of ibuprofen. The comparison is based on the cost to the patient of a typical post dental surgery prescription of 25 pills for each drug. The OTC (over-the-counter) form of ibuprofen is only available in 200 mg tablets. Therefore, a box of 50 pills is considered to be equivalent to 25 pills of 400 mg ibuprofen. Except for the cost of OTC ibuprofen, all other costs include the pharmacy's professional fees. As such, these costs will vary somewhat from city to city and province to province.

On a fractional cost comparison, Motrin (400 mg tablets) is 55 per cent less expensive than ketorolac. Even better value is found with generic ibuprofen (400 mg tablets) and OTC ibuprofen, with fractional costs of 41 per cent and 21 per cent respectively. Hence, the cost to the patient of a typical post dental surgery prescription of ibuprofen is one-half to one-fifth the cost of ketorolac.

For ketorolac to be cost-effective, its significantly higher cost would have to be concomitant with a proven analgesic advantage over ibuprofen. As discussed, a search of the scientific literature to date does not support the premise that ketorolac is superior to ibuprofen for dental use. Therefore, it seems reasonable to conclude that ketorolac is notably less cost effective than ibuprofen for the routine management of post dental extraction pain.

Ketorolac may well be a more potent analgesic than ibuprofen. However, even if this is the case, ketorolac's advantage is not realized when it is used to control post dental extraction pain. In other words, as painful as dental surgery may seem, it may not be painful enough to take advantage of ketorolac's superior analgesic properties, if these properties actually exist.

I do not wish to totally discount ketorolac's usefulness as a dental analgesic. On the contrary, the drug is a welcome addition to our



analgesic armamentarium. For instance, ketorolac is available for intramuscular injection, and is the only true alternative to narcotics via this route. A single intramuscular injection (I.M.) dose of ketorolac (30 mg) has been shown to be as effective as a 100 mg I.M. injection of meperidine (Demerol) for controlling post oral surgery pain.^{8,9}

On top of its I.M. advantage, ketorolac's oral tablet form could be used as a back-up in those few cases where patients do not respond to the normally prescribed analgesics. However, ketorolac, as well as other NSAIDs, including ibuprofen, should not be administered to patients presenting with a medical history of ASA allergy or serious gastrointestinal bleeding due to an underlying peptic ulcer disease.

Nevertheless, at this time it is simply not cost effective to routinely prescribe ketorolac (oral) for acute post dental surgery pain. This applies to all dental surgical procedures with the possible exception of dental impaction surgery, as the intensity of post surgical pain may be significantly higher in these cases. As such, more research is needed on ketorolac's efficacy, particularly with different oral dosage regimens, before it can be recommended for routine use in the management of dental pain.

Ketorolac is an example of how vigorous marketing can make a more costly, but not necessarily superior analgesic, look more attractive compared to what is already available. It is much easier to centre our attention on a visually pleasing product advertisement than on a dry scientific study. But as dentists, we have an obligation to our patients to evaluate the advantages of new therapies as they become available. In doing so, it is imperative that we base our judgements on the objective findings of properly performed scientific investigations rather than on subjective marketing or a clinician's perception. New dental therapies should also be judged on their cost effectiveness to the patient. Otherwise, it would be a disservice to our patients. ■

Table 1

Cost Comparison of Ketorolac and Ibuprofen

Analgesic Type	Total Cost to Patient (\$) ^a	Cost per Dose (\$/Tablet) ^b	Fractional Cost ^c
Ketorolac			
Toradol® 10 mg (25 tablets)	27.50	1.10	1.00
Ibuprofen			
Motrin® 400 mg (25 tablets)	15.00	0.60	0.55
Generic 400 mg (25 tablets)	11.25	0.45	0.41
OTC 200 mg ^d (50 pills)	6.00	0.24	0.21

a. Costs given by a Toronto area pharmacy. These costs include the pharmacy's professional fees. As such, these specific costs may vary from city to city and province to province.

b. Calculated by dividing the total cost to patient by 25 pills. The amount of pills dispensed affects this value.

c. Calculated by dividing the cost of each analgesic by the cost of ketorolac. The value represents the fractional cost of each analgesic to that of ketorolac.

d. Over-the-counter (OTC) ibuprofen is only available in 200 mg pills. Two pills of OTC are equivalent to one Ibuprofen (400 mg) pill. A box of 50 OTC pills is equivalent to dispensing 25 Ibuprofen (400 mg) pills.

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8. Brown, C.R. The analgesic efficacy of ketorolac tromethamine by oral and intramuscular administration in single-dose studies on various postoperative pain states. Paper delivered at the fifth World Congress on Pain. Hamburg, Germany, Aug. 4, 1987.

9. Brown, C.R., Moodie, J.E., Evans, S.A., et al. Efficacy of intramuscular (I.M.) ketorolac and meperidine in pain following major oral surgery. (abstr) *Clin Pharmacol Ther* 43:161, 1988.

DON'T RUSH YOUR BRUSH



If you're brushing for keeps, it takes at least three minutes to do the job right.

DENTAL HEALTH
Good For Life

CANADIAN DENTAL ASSOCIATION

JOURNAL

January/
Janvier
1994
Vol. 60
No. 1

82ND WORLD DENTAL CONGRESS • VANCOUVER OCTOBER 2ND TO 8TH, 1994

UPDATE • UPDATE • UPDATE • UPDATE • UPDATE

Become an Ambassador



In 1986 the city of Vancouver looked for a way to invite people from all over the world to attend World Expo '86. The organizing committee gathered together to brainstorm and come up with something not only creative but also personalized. In the end, a decision was reached to encourage the residents of Vancouver to write to their friends and

acquaintances from abroad and give them a personal invitation to the 1986 World Expo. It was a small gesture that helped to create a prosperous event!

Similarly, the Organizing Committee for the 1994 World Dental Congress next October 2 - 8, 1994 in Vancouver has decided to adopt this concept. **Canadian dentists are encouraged to become ambassadors of the 82nd World Dental Congress by writing to their friends and colleagues worldwide and inviting them to the '94 Congress.** In just a few minutes your personal invitation can help contribute to making FDI '94 a truly international meeting and a successful one.

Once you have sent out your greetings and invitations send your friend or colleague's name and address to the 1994 FDI Organizing Committee c/o Canadian Dental Association either by mail or by fax and we will send them their own copy of the Preliminary Program. The FDI '94 Preliminary Program has been printed in seven different forms and in five different languages so that we can accommodate most everyone. Let us know if your friend/colleague would like to receive a program in either English, French, German, Japanese or Spanish so we can help make their registration process easier.

FDI '94 is now less than a year away — unbelievable! As a new year begins let's work together to make the FDI 1994 Congress the best ever! With cooperation and the spirit of international dentistry you can participate in welcoming our

fellow dental professionals from around the world to join us in Vancouver at the World Dental Congress.

The following pages briefly outline the comprehensive scientific program which has been designed to meet the needs of every member of your dental team. Also included are descriptions of the dynamic social program, fun special events, exciting children's program and elaborate accompanying person's program being offered at FDI '94. Take a few moments to look through the next few pages, then send in your registration(s) right away. Register now so you don't miss out!

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FDI 1994 Organizing Committee
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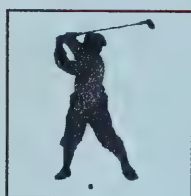


FDI 1994 CONGRESS-AT-A-GLANCE

OCTOBER 2 SUNDAY	OCTOBER 3 MONDAY	OCTOBER 4 TUESDAY	OCTOBER 5 WEDNESDAY	OCTOBER 6 THURSDAY	OCTOBER 7 FRIDAY	OCTOBER 8 SATURDAY
PRE-CONVENTION COURSES (LIMITED ATTENDANCE)		LECTURES, LIVE TV PRESENTATIONS, HANDS-ON COURSES, POSTER PRESENTATIONS AND TABLE CLINICS FOR DENTISTS, ASSISTANTS, HYGIENISTS, TECHNICIANS AND OFFICE PERSONNEL				POST- CONVENTION
	OPENING CEREMONY	DENTAL TRADE EXHIBITION				
DINNER CRUISE	INTERNATIONAL EVENING	CHINESE EVENING	SALMON BARBECUE	FDI BALL		
	VISITS AND ONE DAY TOURS, ACCOMPANYING PERSONS' PROGRAM, CHILDREN'S PROGRAM					TOUR
PRE- CONGRESS TOURS	FDI BUSINESS MEETINGS FROM SEPTEMBER 29TH TO OCTOBER 8TH					POST- CONGRESS TOURS



SPECIAL ACTIVITIES



GOLF DAY

Wednesday, October 5

Golfing enthusiasts — this is your day!

Take part in the FDI golf tournament which will be held at one of Vancouver's numerous, lush golf courses. It will be a shotgun start. **Register today for this event!** Due to space limitations, only 140 golfers will be registered on a first-come, first-served basis.

A golf shop will be available for rental of golf clubs and other standard equipment. The registration fee includes transportation to the golf course as well as a meal.



FUN RUN & WALK

Thursday, October 6

07:00 - 09:00

Join your fellow international runners in a 5 kilometer run or walk or a 10 kilometer run along the Sea Wall of Vancouver famous Stanley Park, located near the downtown area.

Awards will be given to the winners of the competition but if you prefer to savour the scenic trails, you may run or walk at your own speed!

The registration fee includes transportation from the Convention Centre to Stanley Park, a limited edition T-shirt, a snack and a beverage.

LIMITED ATTENDANCE COURSES

FDI
1994



STANLEY MALAMED (USA)

**"Pain and Fear and
the Future of Dentistry"**

Sunday, October 2 • All-day lecture, presented in English

The management of pain and anxiety form the backbone of contemporary dental practice. The past decades have seen the introduction of a significant number of promising new techniques, drugs and equipment designed to aid the dental professional in a quest for a more pain-free and fear-free dental practice. In this program, the lecturer will discuss these advances, with an eye towards their possible applications in dentistry. Included will be a discussion of the relatively new technique of electronic dental anesthesia (EDA).



CLYDE SCHULTZ (USA)

**"Recession Proof Your Practice: Strategies for
Minimizing the Effects of Economic Downturn"**

Sunday, October 2 • All-day lecture, presented in English

The objective of this program is to teach survival strategies for hard times. This includes advice on what to do and not to do in your office, with emphasis on positive techniques and effective strategies for dealing with patients, insurance problems, and communication with your staff.

Topics include: Recession proof the demand in your practice through powerful team communication techniques; Build trust and reduce stress as you show patients you share their goals for treatment; Never worry about filling your appointment book again!



ROY PAGE (USA)

**"Periodontics for the 1990's
and Beyond"**

Monday, October 3 • All-day lecture, presented in English

The goal of this program is to summarize the major developments that have occurred in periodontics and periodontology over the past decade, and to project developments likely to occur in the immediate future. New approaches to treatment of the various kinds of periodontitis will be described and illustrated.



RONALD FEINMAN (USA)

**"Aesthetic Restorative Procedures,
How, When and Why?"**

Sunday, October 2 • All-day lecture, presented in English

This program will broaden the dentist's horizon in practicing dentistry as it explores a complete gamut of restorative dentistry today. Subjects will include porcelain veneers, bleaching teeth (office and home), direct and indirect composite systems, glass ionomers and cements, current retraction techniques, resin-bonded bridges and cosmetic tissue relationships. Eliminate the confusion by learning what, when, where and how to use.



TERRY DONOVAN (USA)

**"Aesthetic Restorative Dentistry and
Materials Update"**

Monday, October 3 • All-day lecture, presented in English

There is a host of options for the contemporary dentist in treating patients interested in esthetic dentistry. Many of these are less invasive than many of our conventional restorative therapies.

This presentation will delineate the procedures necessary for success with conventional and contemporary adhesive restorative dentistry. Many of the newer products will be evaluated and compared; emphasis will be on clinical product manipulation. Topics to be covered include: Effective gingival displacement; Impression materials: techniques for use; Solutions for fractured porcelain; bleaching, enamel micro-abrasion; bonded porcelain (veneers, crowns, inlays, onlays).

All-day Limited Attendance Courses allow the speaker to spend more time on antecedents, discuss different treatment procedures and thoroughly review specific cases. The participants benefit immensely from this sustained lecturing in a single field of dentistry. The number of participants will be restricted by room capacity.



GLEN MCGIVNEY (USA)

"Removable Partial Denture"

Monday, October 3

All-day participation course, presented in English

This hands-on course will provide the participant with the skills necessary to fabricate a well-fitting, esthetic and functioning removable partial prosthesis.

The course will cover:

1. The common causes of failure of partial dentures,
2. Treatment planning,
3. A systematic approach to design, and
4. Simulated intra-oral tooth preparation, surveyor use and actual design.



ALAN BOGHOSIAN (USA)

"Dental Materials for Dental Assistants"

Tuesday, October 4

A.M. participation course, presented in English

The continuous development and evolution of dental materials have greatly contributed to improvement in the restoration and preservation of natural tooth structure. Restorative modalities exist today that were not deemed possible a decade ago.

This lecture and participation course will discuss properties and allow for the hands-on mixing and manipulation of traditional and recently introduced dental materials. Participants will have the opportunity to handle several categories of dental materials including cements, impression materials and light cured restoratives. This course will emphasize techniques to maximize the physical properties of the material while allowing for modification of handling properties such as work and setting times.



ST. JOHN'S AMBULANCE (CANADA)

"Cardio-pulmonary Resuscitation"

Tuesday, October 4

All-day participation course, presented in English

Wednesday, October 5 (repeat)

Thursday, October 6 (repeat)

The C.P.R. Level 'C' course meets Canadian Heart Foundation standards. This five to six hour course is designed for Health Care Professionals. It offers one and two operator C.P.R. for the adult, as well as child and infant resuscitation and obstructed airway procedures for adult, child and infant. Certification is recommended to be renewed yearly.



PAT ROBERTSON ET AL (CANADA)

"Dental Radiography"

Tuesday, October 4

A.M. participation course, presented in English

Are your patients receiving the maximum diagnostic information for the minimum exposure to radiation? This program is designed for Certified Dental Assistants and Dental Hygienists with some experience in taking dental radiographs. Practical sessions with mannequins will involve small group demonstrations and discussion on bite-wing technique, endodontic radiography and troubleshooting difficult film placements.



HERBERT BADER (USA)

**"Root Planing and Scaling:
Evolution or Revolution"**

Tuesday, October 4

A.M. participation course, presented in English

The most difficult and critical modality or therapy in dentistry is scaling and root planing. This hands-on course covers the in-depth use of ultrasonic instrumentation. The participant will be exposed to the theory and practice of ultrasonics and be given an opportunity to utilize the latest in piezo electric instrumentation on a typodont.

The attendee will receive a complete overview of the field with an excellent skill enhancement opportunity to become familiar with the most current and exciting techniques.



SHERRY BURNS &

NANCY KNISPEL (USA)

**"Isn't It About Time to Get on the Cutting Edge?
The Care, Maintenance and Sharpening of
Periodontal Instruments"**

Wednesday, October 5

A.M. participation course, presented in English

This new and innovative technique for learning instrument sharpening will have you on the cutting edge in no time. And sharp instruments mean higher productivity, longer instrument life and greater effectiveness.

This HALF DAY workshop includes lecture, demonstration and practice of instrument sharpening for sickle scalers and curettes. This new approach to instrument sharpening makes it easy to learn and to apply. A sharpening kit will be available for purchase.

HANDS-ON COURSES



Howard Martin (USA)

"Endodontics for the '90s - Flare, File, Fill"

Wednesday, October 5

All-day participation course, presented in English

This participation course will increase your clinical experience in technological advances to quickly improve your success and do more endodontics with ease, effectiveness and efficiency.

1. Utilizing ultrasonic biotechnological root canal preparation (Caviendo).
2. The warm lateral condensation technique (Endotec).
3. Control safe end K/H file and handle.



KEITH ROSSEIN (USA)

**"Provisional Restorations:
Two User Friendly Restorative Techniques"**

Wednesday, October 5

A.M. participation course, presented in English

This is a hands-on workshop that will provide participants with two restorative techniques that can be immediately implemented in everyday practice. Using periodontal "splinting bars", participants will construct an "embedded bar bridge". This is a quick, permanent alternative to the traditional bridge, especially in today's economy.

In the second part, participants will construct high quality provisional bridges utilizing the Press Form Technique. This procedure will drastically reduce the amount of time needed to be scheduled for crown & bridge appointments and will minimize patient return-for-repair visits. All participants will leave with professional study models that are ideal for patient case presentation.



**SHERRY BURNS &
NANCY KNISPEL (USA)**

**"How to Choose and How to Use the
Newest Curettes - Periodontal
Instrumentation Workshop"**

Wednesday, October 5

P.M. participation course, presented in English

This workshop will provide an opportunity for hands-on exercises using After Five, Mini Five, Langer and Rigid Series curettes. Practice will be accomplished using typodont models and extracted teeth. Strategies for developing instrument set-ups will also be presented.



TED DE VRIES (CANADA)

"Computers - Up Close and Personal"

Thursday, October 6

All-day participation course, presented in English

This session will give participants an opportunity to gain hands-on experience with various aspects of today's complete computer solutions. Demonstrations will cover basic components of the computer, the highly popular windows environment and a detailed look at a complete dental management system. The wide array of features that are incorporated in the dental software will be explained and left for you to experiment with.



**MICHAEL GOLDFOGEL &
ALLEN KINCHELOE (USA)**

"Esthetic Dentistry 1994"

Thursday, October 6

All-day participation course, presented in English

This course is a full day course combining 1/2 day lecture with a 1/2 day hands on experience in a laboratory setting. The morning lecture serves as a didactic presentation showing step by step esthetic dental techniques. The participation reinforces the lecture material and allows the practitioner to use the most modern dental esthetic materials.

Topics to be included in this presentation are:

1. Most recent advances in esthetic materials,
2. Free hand veneering,
3. Diastema closure,
4. Porcelain veneers,
5. Masking discoloured teeth, and
6. Understanding of colour.



JEFFREY SHERMAN (USA)

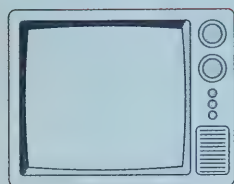
"Dental Electrosurgery for the 90's"

Thursday, October 6

A.M. participation course, presented in English

Electrosurgical techniques are truly designed for the modern practice of dentistry. Electrosurgery, with its assortment of electrode tips, permits carving, sculpturing, or altering of soft tissue with little or no hemorrhage.

This course includes a complete discussion and demonstration of all electrosurgical cutting, coagulation, and fulguration modes on the latest electrosurgical equipment. The participants will have the opportunity to practice the various types of procedures including frenectomy, operculectomy, crown preparation and biopsy under the supervision of the clinician.

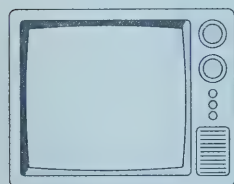


**STEPHEN LEWIS (USA) &
PETER STEVENSON-MOORE
(CANADA)**

**"Osseointegrated Implants for the
Partially Edentulous Patient"**

*Wednesday, October 5 • A.M. presentation in English
Simultaneous interpretation into French,
German and Spanish*

Due to the overwhelming success of osseointegrated implants in edentulous patients it seemed only reasonable to apply osseointegration to the partially edentulous patient population as well. One major concern was that of esthetics, the ability to fabricate restorations which appear as natural teeth emerging through the mucosa. This live television presentation will demonstrate on a patient the implant components, techniques, and surgical/restorative interactions in order to achieve successful esthetic restorations for the partially edentulous patient.



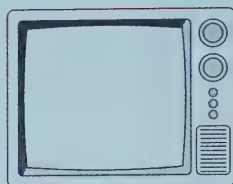
TERRY DONOVAN (USA)
"Porcelain Veneering Made Easy"

*Wednesday, October 5 • P.M. presentation in English
Simultaneous interpretation into French,
German and Spanish*

The popularity of porcelain veneers in the dental office is ever increasing due to patient awareness and demand. If success is to be achieved in creating porcelain veneers that truly reflect natural teeth, the dentist and the other members of the dental team must coordinate their efforts. This live television presentation will show all procedures leading to a successful preparation of porcelain veneers. All steps including treatment planning, tooth preparation, taking of impressions as well as cementation will be demonstrated live on a patient.

Live television presentations will constitute a vital part of the Congress. General practitioners will benefit from illustrations by skilled clinicians demonstrating new techniques and diverse procedures. Demonstrations will be shown live via giant screen TV. Participants will have an opportunity to ask questions to the clinician as he performs procedures on patients.

* Other presentations will be available during the Congress.

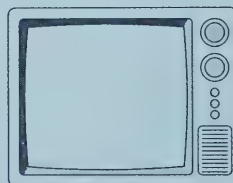


"Guided Tissue Regeneration"

*Thursday, October 6 • A.M. presentation in English
Simultaneous interpretation into French,
German, Japanese and Spanish*

Guided tissue regeneration offers the clinician a technique which has the potential to restore supporting tissues lost as a result of periodontal diseases. The technique relies on the use of physical barriers to exclude gingival epithelium and connective tissue from healing wound.

The demonstration will clearly show flap design, incisions, defect and root debridement and membrane placement. We will demonstrate adaptation and wound closure. Post-operative instructions and time for membrane removal will be discussed.



**WERNER MORMANN
(SWITZERLAND)**
**"Computer-aided Direct
Ceramic Restorations"**

*Thursday, October 6 • Noon presentation in English
Simultaneous interpretation into French, German,
Japanese and Spanish*

The clinician will perform a restorative procedure on a live patient using a chair-side computer-aided design and manufacturing technique for producing ceramic inlays, onlays and veneer laminates. Additional presentation, reservation on-site.



HERBERT BADER (USA)
**"Hand and Powered Root Instru-
mentation: The Heart and Soul
of Periodontal Therapy"**

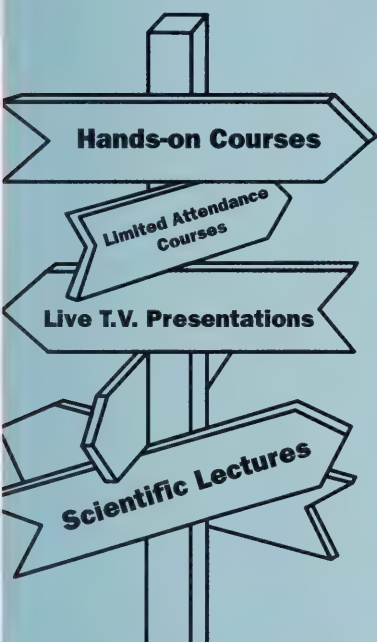
*Thursday, October 6 • P.M. presentation in English
Simultaneous interpretation into French, German,
Japanese and Spanish*

Successful management of the periodontal patient begins and ends with control of the root surface environment. This program addresses that issue with benchtop and live patient demonstration of the most current techniques and instruments to achieve a root surface compatible with biologic health. The attendee will become familiar with the new generation of hand instruments and ultrasonic systems, including a discussion and demonstration of the effects of antimicrobial lavage with ultrasonic scalars.

DENTAL TEAM PROGRAM



Programs of Interest to the Entire Dental Team



During FDI '94, the world's focus will be on oral health and the role of each member of the dental team is recognized as crucially important to ensure and maintain the quality of care world-wide. For this reason, special attention has been given to developing a scientific program of particular interest to the entire dental team.

Dental hygienists, dental assistants, office personnel and dental technicians will not want to miss hands-on and limited attendance courses, live television presentations and scientific lectures designed to enhance their knowledge of the latest technological developments. The technical exhibition, the largest ever held in Canada, will also provide useful information on new products. Finally, a supplementary program on topics such as dental hygiene in the world, irrigation, stress, nutrition, chairside dental assisting, communications, photography and dental assisting in a specialty practice will also be available.

We foresee that all ticketed events will sell quickly, so register early and reserve your place in limited attendance courses and lectures. Furthermore, we invite you to take full advantage of all the activities designed for you. Plan to attend the Opening Ceremony, take part in the social program and enjoy the visits and tours organized for all Congress participants.

POSTER PRESENTATIONS



TABLE CLINICS • FREE COMMUNICATIONS

The FDI invites Congress Participants to report on the results of their work or share scientific information or techniques with their colleagues from around the world by giving either a table clinic, poster presentation or free communication.

To qualify you must register for the Congress and fill out enrolment form B which is attached to enrolment form A. These forms were mailed together with this month's *Journal* or you can find them in the center of your *1994 Preliminary Program*.

Applications should be sent to arrive at the FDI 1994 Organizing Committee, c/o Canadian Dental Association no later than April 1, 1994.

All dentists are invited to participate.





10 GOOD REASONS WHY YOU SHOULD REGISTER (EARLY) FOR THE FDI CONGRESS —



Enjoy the most comprehensive scientific program ever assembled for an FDI Congress.



Combine a vacation with the FDI Congress. Take the opportunity to savour the beauty of Western Canada's unspoiled scenery.



Attend just ONE convention and have access to many different lectures, hands-on courses and live television presentations.



Meet your colleagues from the world over.



Learn new techniques that you can apply immediately upon your return to the office.



Qualify for the car draw and for other on-site draws.



Fulfil your continuing education credit needs. We will provide proof of attendance for every lecture you attend.



Pre-register before May 15, 1994 and pay a reduced registration fee.



Take advantage of programs designed not only for yourself but for your family and your entire dental team.



The latest products and technological developments will be on display in the exhibit hall and will be yours to discover!

WORLD FOCUS ON ORAL HEALTH
FDI
1994

82nd World Dental Congress
VANCOUVER, CANADA
Oct. 2-8, 1994

SOCIAL PROGRAM

FDI
1994

OPENING CEREMONY

MONDAY, OCTOBER 3 * 17:15 - 19:30

The Opening Ceremony of the 82nd Annual World Dental Congress, sponsored by **Nobelpharma**, will take place at the Vancouver Trade and Convention Centre, which is in close proximity to all downtown hotels. Come and enjoy this two-hour extravaganza featuring the best talent Vancouver and Canada have to offer. After short welcoming speeches and a unique and exciting roll call of nations, the show will begin! Dancing and entertainment on the theme of cultural diversity will be the highlight of this program. This event promises to have something for everyone's taste!

All Congress participants are invited to attend the Opening Ceremony. Tickets are available on request to registered participants only - be sure to request your ticket when you register for the FDI Congress.

INTERNATIONAL EVENING

MONDAY, OCTOBER 3 * 19:30 - 22:30

Continue the celebration of the opening of the 82nd Annual World Dental Congress at the Pan Pacific Hotel where you will be immersed in an international atmosphere. Various international stations with food, song and dance will "transport" you around the world in just three hours! This is the perfect occasion to get to know your colleagues from other countries before the Congress begins.

FDI SCENIC EVENING DINNER CRUISE SUNDAY, OCTOBER 2 * 19:00 - 22:00

An evening aboard one of Vancouver's many private yachts gives you a marvelous view of the city and its waterfront. Enjoy a sumptuous West Coast barbecue on board while you watch the scenery and sunset slip by. Live music tops off this relaxing and fun-filled event. In a city surrounded by water, a boat trip is the best possible way to capture West Coast charm and adventure.

DISCOVER THE ORIENT EVENING

TUESDAY, OCTOBER 4 * 19:00 - 23:00

Vancouver's largest ethnic community, and North America's second largest Chinatown, has fostered the establishment of Chinese cuisine that rivals Hong Kong and Taipei. Enjoy an evening of classical Chinese dance and music as accompaniment to an exquisite selection of foods served at traditional Chinese banquets. This evening, catered by one of the finest restaurants in the city, will be a highlight of the Congress.

SALMON BBQ / LOGGING SHOW

WEDNESDAY, OCTOBER 5 * 19:00 - 24:00

This unique evening will be a tribute to the legendary man of the wood, the logger. The evening begins with a full scale competitive Logger's Sports Show featuring actual lumberjacks demonstrating the art of axe-throwing, log rolling, pole climbing and many other daring skills. A sumptuous buffet dinner will be served, including the delectable B.C. salmon and a tempting array of hot and cold menu items that feature the finest and freshest in West Coast cuisine. A lively band will keep you dancing until the end of the evening. Casual dress is recommended.

FDI BALL

THURSDAY, OCTOBER 6 * 20:00 - 01:00

From the menu to the decor, the Black and White theme will be all around you. Be creative with your black and white wardrobe and blend with the decor! A prize will be awarded for the best costume. Music will range from classical to jazz and from swing to rock'n'roll, as a dinner without parallel is served. Black tie is optional.

Vancouver City Tour

Monday, October 3
09:00 - 12:00

Tuesday, October 4
09:00 - 12:00

Enjoy a tour aboard our comfortable deluxe coaches and receive an introduction to beautiful Vancouver. We start with a drive through Stanley Park, a 1,000 acre forest set in the heart of downtown. After admiring the magnificent view of the harbour and the North Shore mountains, we move on to one of the city's finest residential areas, Shaughnessy, with its stately homes and impressive embassies. We then proceed to Queen Elizabeth Park to view the sunken gardens and the Bloedel Conservatory, where a rich assortment of flowers and plants from the tropical rainforests are cultivated. Other tour highlights include exotic Chinatown, the second largest Chinese community in North America, and historic Gastown, with its quaint cobblestone streets and unique shops housed in turn-of-the-century buildings.

Salmon Fishing

Monday, October 3
06:30 - 11:30

Friday, October 7
06:30 - 11:30

Take advantage of Vancouver's proximity to the sea and indulge in one of the favourite pastimes of visitors and local folk alike! Spend the day on the water and experience the challenge of salmon fishing in beautiful British Columbia. Relax on a specially equipped fishing yacht while the skipper and fishing rod do the work. All the fish stories you've heard are absolutely true, as Vancouver is indeed a sport fisherman's paradise!

Scenic Harbour Cruise

Tuesday, October 4 • 13:30 - 16:30

A cruise is always a popular choice and with good reason. The charm of the inner harbour is best appreciated from the water itself. Superb views of the city skyline drift by and picture postcard scenery unfolds all around. There are wonderful destinations whatever direction the boat takes. The sights are dazzling and there's the opportunity of sporting

North Shore & Grouse Mountain Tour

Tuesday, October 4
09:00 - 13:00

Thursday, October 6
09:00 - 13:00

This tour will make you feel like you're sitting on top of the world! You will travel via Stanley Park and the Lion's Gate Bridge to the North Shore, and up the Capilano Canyon to the base of Grouse Mountain. Then you'll ascend by sky tram to Grouse's 3,700 foot high vantage point. Enjoy a panoramic view of Vancouver with time to explore or attend the "Theatre in the Sky". Next a visit to the Capilano Suspension Bridge and Fish Hatchery, a fascinating salmon enhancement project noted for its famous "Fish Ladder". Then a visit to the Lonsdale Quay, a wonderful waterfront collage of shops, bistros and markets. Guests are free to explore and then return to the city via Sea Bus for which tickets are provided. The Sea Bus is a 12 minute ride to the city centre crossing the Burrard Inlet. The city terminal is within easy walking distance of the Vancouver Trade and Convention Centre.

Vancouver City & Granville Island

Tuesday, October 4
13:00 - 17:00

Wednesday, October 5
09:00 - 13:00

Board one of our comfortable modern coaches for a fully commented tour of one of the most beautiful cities in the world. The drive through our famous Stanley Park, will display a magnificent view of the harbour. Proceed later to one of the City's most famous residential areas, Shaughnessy, and then to Queen Elizabeth Park with its beautiful sunken gardens and the Bloedel Conservatory to view the rich assortment of tropical plants and birds. Next stop will be Granville Island to peruse the market and visit the shops, galleries and bistros. Here you will have a short period of free time, but for those who wish to explore further, you might consider staying on your own and returning by city bus or mini-ferry. Both have convenient connections and frequent departures.

Vancouver Aquarium: "Breakfast with the Whales"

Wednesday, October 5 • 07:30 - 10:30

Experience a truly unique way to start the day by taking a whale to brunch! An early departure will take guests to Vancouver's award-winning Public Aquarium to enjoy a buffet style breakfast amidst over 7,000 species of sea life, including both killer and Beluga whales, dolphins, sea otters, sharks and exotic fish. The tour will then continue over the impressive Lion's Gate Bridge over enroute to the "North Shore". In North Vancouver, we will visit the famous Capilano Suspension Bridge and Nature Park. For more than a century this bridge has awed thousands of visitors as they walk over its 450 foot span and gaze at the Capilano River 250 feet below. This site also houses a historic log cabin trading post stocked with souvenirs and a resident native Indian Totem Pole carver.

Museum of Anthropology

Wednesday, October 5 Thursday, October 6
13:00 - 16:30 09:00 - 12:30

The Museum of Anthropology, on the grounds of the University of British Columbia, is dedicated to the preservation and presentation of artifacts unique to West Coast Indian culture and is high on the list of must-sees for those with a taste for history and art. The Museum's treasures are housed in an impressive building designed by Arthur Erickson. In addition to the permanent displays, the museum also plays host to various travelling collections. We are pleased to invite you to come with us as we make our way by deluxe motorcoach to one of Canada's most renowned and celebrated museums.



Royal Hudson Steam Train & Britannia Excursion

Thursday, October 6 • 09:30 - 16:00

Enjoy a different scenic perspective of spectacular Howe Sound by joining us on the Royal Hudson steam train. From the first "All Aboard!" the legendary Royal Hudson train takes you as far as the quaint logging town of Squamish. Not only is the train a delightful novelty, it's also the means by which we are able to take in some of B.C.'s most breathtaking scenery as we wind our way through mountains and cliffs, canyons and gorges, complete with waterfalls. It is even possible to spot wildlife such as deer, black bear and bald eagles along the way. After some free time in the town of Squamish, we board the majestic "Britannia" for the return cruise to Vancouver (lunch included). Bring your cameras! This is a wonderful opportunity for sightseeing.

A Day in Victoria

Friday, October 7 • 07:30 - 19:30

Victoria, British Columbia's capital is a charming city with a distinct olde-world atmosphere located on Vancouver Island. Our day will begin with a coach ride to Tsawwassen, where we board a B.C. ferry for a 1 1/2 hour cruise. Spectacular scenery will be enjoyed along the way. Once we dock, we'll proceed to the Butchart Gardens, perhaps the most awe-inspiring collection of plants and flowers in North America with exquisite examples of landscaping from many countries. After much leisure time, you'll visit Victoria's city centre, for a free afternoon to visit fabulous museums, shops and art galleries. The picturesque inner harbour area adorned with colourful boats, heritage buildings and flowers hanging from old-time lamp posts will delight you.

Whistler Mountain Day Trip

Saturday, October 8 • 09:30 - 17:30

Whistler attracts thousands of visitors year round who come to enjoy the sports facilities, quaint European style village, fabulous shops and restaurants set amid the splendour of alpine scenery. Whatever your interest, Whistler has something for everyone, and a day excursion to this world renowned resort is a wonderful choice. Deluxe motorcoach transportation lets you sit back and enjoy the stunning mountain views enroute. Upon arrival at Whistler Village the time is yours to stroll, shop and participate in the various sporting and sightseeing activities. Come see for yourself why they call it the "Whistler Experience".

North Shore Excursion

Thursday, October 6 • 08:30 - 16:00

A fully commented motorcoach tour starts the day with a scenic drive over Lion's Gate Bridge and on to the Capilano Fish Hatcheries. Then it's on to the peak of Grouse Mountain by aerial gondola where the 3,700 foot vantage commands a panoramic view of Vancouver and the distant Gulf Islands. Continue on to the Capilano Suspension Bridge and nature park and then enjoy an authentic Potlatch barbecue lunch at one of the canyon's fine restaurants. Last, but not least, is a visit to the Lonsdale Quay, where kids board the Sea Bus for a 15 minute journey across the Burrard Inlet to downtown Vancouver.

**Science World/
Omnimax Theatre
Wednesday,
October 5
08:30 - 16:00**

A brief ride aboard the Skytrain monorail brings young participants to Science World on the shores of False Creek. This fun "hands on" museum has 7 unique galleries offering a staggering range of scientific activities and adventures: robots and computers, dinosaurs and glowing plasma balls. Youngsters will delve into an exciting new world of peculiar sights, sounds and sensations. Included is a visit to the spectacular Omnimax Theatre which boasts the world's largest domed screen. Participants will enjoy all the action of the current science and nature film being shown.

**All tours are
coordinated by FDI
and Y.M.C.A. staff
and include
transportation,
lunch and
refreshments.**

Vancouver Aquarium and Stanley Park

Tuesday, October 4 • 08:30 - 16:00

The adventure starts with an exploration by bus around the perimeter of world famous Stanley Park. Spanning 1,000 acres, Stanley Park is noted as one of North America's largest inner city parks, offering an entertaining array of attractions and amenities. A featured stop takes in the award-winning Vancouver Aquarium, located at the parks center. Children will have the opportunity to explore Canada's largest aquarium containing over 9,000 species of marine life from every corner of the world.

Afterwards, participants are treated to a fully escorted walking tour of Stanley Park which includes Beaver Lake, the Children's Farm Yard, Lost Lagoon and the Totem Poles at Brockton Point. A delightful opportunity for youngsters to enjoy fresh air and nature's wide open spaces right in the heart of the city.

EXHIBITS

FDI
1994

The 1994 FDI Congress will accommodate the largest dental trade exhibition ever held in Canada! At the time this was printed, over 500 booths had already been booked. The exhibits will be housed at the Vancouver Trade & Convention Centre and will be held over a 4-day period from Tuesday, October 4 to Friday, October 7 inclusive.

The cooperation from the dental industry and the hard work put forth from the FDI 1994 Committee and Staff have resulted in a completely filled exhibit hall one year in advance of the meeting! The proposed exhibit space has been sold-out and we have opened a second area to meet the demand! This second area will also be located in the Vancouver Trade & Convention Centre and situated near the registration desks, table clinics, poster presentations and free communications.

The Canadian, International and U.S. dental industries have responded enthusiastically to the 1994 FDI Congress. The latest products and technological developments on display will transform the exhibit hall into a gigantic "marketplace" and will be yours to discover! The trade exhibition will be the meeting place par excellence for all delegates.

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FDI '94 PRE AND POST CONGRESS TOURS

ALASKA (September 24 - October 1, 1994)



A memorable 7 night cruise to Alaska aboard Holland America's M.S. Westerdam. Heading up the inside passage, enjoy many delightful ports of Ketchikan (Alaska's first city), Juneau (Alaska's capital) and Glacier Bay (where the mighty glaciers will take your breath away!). A trip of a lifetime!

CANADIAN ROCKY MOUNTAINS (October 8 - 11, 1994)



See the wonders of the Canadian Rocky Mountains on this 4 day/3 night train and bus excursion. Travel through spectacular scenery during the day and enjoy comfortable hotel accommodations at night. You will see a wide variety of wildlife and natural attractions that Alberta and British Columbia have to offer; including the wonderful destinations of Jasper, Banff and Lake Louise.

HAWAII (October 7 - 14, 1994)



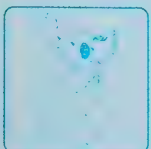
Enjoy a fabulous 8 day/7 night vacation in Hawaii on the island of Oahu. You can stay at the Hilton Hawaiian Village or at the Pacific Beach Hotel, both situated on the beautiful Waikiki beach. A perfect tour for those wishing to relax and enjoy the magnificent view of Hawaii.

LOS ANGELES (October 10 - 13, 1994)



Enjoy a marvelous 4 day/3 night cruise aboard Holland America's M.S. Westerdam from Vancouver to Los Angeles along the Canadian and U.S. coast. Since the cruise departs on October 10th, this is the perfect tour for those wishing to do some post-conference sightseeing in Vancouver.

AUSTRALIA AND NEW ZEALAND (October 7 - 21, 1994)



An incredible 15 day/14 night post-conference tour "down-under". In Australia, visit Cairns, the great Barrier Reef, the rain forests, Sydney, the Blue Mountains and go on a wine tour. In New Zealand, see the Coromandel Peninsula and Rotorua thermal springs. You will also have the opportunity to stay either on a sheep, kiwi fruit or cattle farm for two nights. Each farm will host 2 couples from our group – a sure way to enjoy local New Zealand hospitality. From here, optional stopovers for 4 days/3 nights in either Fiji or Hawaii.

For more detailed information,
contact the FDI 1994 Organizing Committee
at 1-800-267-6354 by telephone or at (613) 523-3062 by fax.

THE CANADIAN DENTAL ASSOCIATION OUT-OF-COUNTRY SEMINARS



...IN ISRAEL

February 16 - 28, 1994

*in collaboration with
the Israel Dental Association*

This unique 13-day tour to Israel, the "Promised land flowing with milk and honey", takes you to the modern metropolis of Tel-Aviv and into the ancient ports of Jaffa, Acco, Haifa and Caesarea. Stretching between the Mediterranean and the Red Sea, Israel beckons you to a voyage of discovery offering sites which date back to ancient times. You will travel through the lush region of Galilee where Christianity had much of its origins and you will have the opportunity to admire the splendor of the snow-capped peaks of Mount Hermon. You may also choose to bathe in the Dead Sea, which, located at 1300 feet below sea level, would be a totally desolate area were it not for its oasis offering refreshment to the traveller. Finally, you will ascent to Massada, the last stronghold of the Jewish Zealots against the Romans, standing as a memorial to this day.

...IN TURKEY

April 15 - 28, 1994

*in collaboration with
the Turkish Dental Association*

This unforgettable 14-day journey will take you to the former Ottoman Empire as well as to the modern city of Istanbul. Old and new come together in this country where past, present and future blend to offer the most intriguing and fascinating sites. Through breathtaking landscapes, you will visit a country that stretches from undisturbed coves along dazzling multi-faceted coasts to silent peaks of towering mountains. Your voyage will let you discover ancient marble temples built in honor of the gods and stirring architecture reminiscent of times long past. Among the numerous sites that you will enjoy on this unforgettable trip is Pamukkale, a city where natural springs and thermal water pools flow from terraced cliffs. You will walk through Goreme, an ancient city where 7th century Christians carved shelters directly from the rock formations. Tour also consists of visits to Ankara, Cappadocia, Antalya, Kusadasi and Ephesus.



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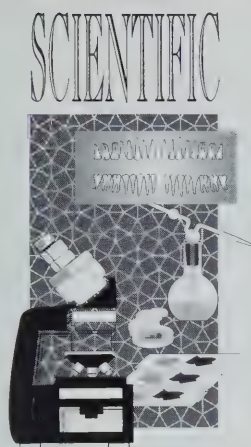
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Working Time of Synthetic Elastomeric Impression Material

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ABSTRACT

This study will introduce a new method for measuring the working time of elastomeric impression materials, taking into account the perceived shortcomings of existing systems for evaluating these times. The working times of various commercially available polysulfide, addition reaction silicones and polyethers were determined at room temperature (20°C), following storage in a refrigerator (6°C), and at mouth temperature (35°C). At room temperature, the polysulfides demonstrated the longest working times and the silicones the shortest. Both the polysulfides and the silicones had longer working times following storage at 6°C for 24 hours. However, the polyethers were found to be unusable at this temperature. All the impression materials had shorter working times when placed into the testing apparatus, which had been heated to mouth temperature.

SOMMAIRE

Dans cet article, on présente une nouvelle méthode pour mesurer le temps de travail des matériaux d'empreinte élastomériques en tenant compte des défauts qu'on a relevés dans les méthodes de mesure actuelles. Les temps de travail de divers produits commerciaux comme les polysulfures, les silicones et les polyéthers addition-

réaction ont été calculés à la température ambiante (20°C) après entreposage au réfrigérateur et à la température de la bouche (35°C). A la température ambiante, ce sont les polysulfures qui prennent le temps de travail le plus long et les silicones qui prennent le plus court, mais les deux produits exigent un temps de travail plus long après un entreposage de 24 heures à 6°C. Quant aux polyéthers, il se sont révélés inutilisables à cette température. Tous les matériaux d'empreinte ont exigé un temps de travail plus court lorsqu'on les a placés dans un appareil d'essai porté à la température de la bouche.

Introduction

Impression materials should record accurately both the soft and hard tissues in the mouth. The performance of an impression material depends on properties such as flow, working and setting time, tear strength, accuracy in recording surface detail, and dimensional stability. Whereas the accuracy and dimensional stability of synthetic elastomeric impression materials have been the subject of numerous investigations,¹⁻⁴ little has been written on their working time.

Nayyar et al⁵ studied the working time of polyethers and polysulfides using three different test methods: the test method in ADA Speci-

fication Number 19⁶; a clinical evaluation by five dentists; and a Wilson Rheometer.⁷ Stannard and Craig⁸ used a "compressive-set" working-times test to evaluate changes in working time following the use of polymerization retarders.

Working time, as defined by ISO Standard Number 4823, begins with the start of mixing and ends when the impression material begins to develop elastic properties. Therefore, the working time of an acceptable material must exceed the time required for mixing, filling the syringe and/or tray, injecting around the preparation, and the seating of the tray.⁹ Ordinarily, the working time is measured at room temperature.

Various other tests have been devised to measure the working time.^{9,10} However, the working time might be considered to have ended when a needle of a certain diameter and weight fails to penetrate a volume of impression material to a specific depth. In the British Standards Test, a reciprocating rheometer is used to measure the working time. The property being recorded is more closely related to changes in the viscosity and shear properties on the surface than to the elasticity of the mass. Furthermore, the reciprocating rheometer is a relatively complicated instrument, it is not commercially available, very few exist, and no two are alike.

In the American Dental Association's Specification Number 19,⁶ working time is determined from an indirect measurement of viscosity. Working time, as determined by this method or by a clinical test, such as prodding the impression material with a blunt instrument when it is in the mouth, tends to be somewhat shorter than the working time recorded by a rheometer.⁹

This study will assess an alternate method for measuring the working time of elastomeric materials, taking into account the above concerns, and compare the working time of several elastomeric materials. Working times will be determined for polysulfide, addition silicone, and polyether impression material systems at room temperatures, following storage in a refrigerator and following placement into the testing apparatus, which has been heated to mouth temperature.

Materials and Methods

Fourteen elastomeric impression materials were selected to represent the polysulfide, polyether and addition reaction silicone systems (Table I).

A technique and dash-pot device was designed for measuring the working time of elastomeric materials. The pot component, which had an internal diameter of 25.0 mm and was 21.0 mm deep, was secured to the platen of the load cell. The dash component, which was 12.0 mm in diameter with a thickness of 3.0 mm, was attached to a 5.0 mm diameter rod that was fixed to the cross-head of the Instron tensile testing machine, then cycled within the central one-third (7.0 mm) of the pot at a cross-head speed of approximately 5.0 cm/min (2.0 inches/min.) (Fig. 1).

The impression materials were mixed according to the manufacturer's recommendations. Following mixing, each material was loaded into the "pot" using a 30.0 cc plastic syringe. Immediately after filling, the cross head was lowered so that the dash was orientated within the central third of the pot, the cap plate was quickly secured to the pot by thumb nuts, and the cyclic mode was activated. This was accomplished within 20

Table I
Materials Tested

Type	Brand	Manufacturer/Distributor
Addition Silicone	Perfourm (Medium)	Miles/Bayer (Canada)
Addition Silicone	Baysilex (Mono)	Miles/Bayer (Canada)
Addition Silicone	Express (Light Syringe)	3M (Canada)
Addition Silicone	Imprint (S.Ph Syringe)	3M (Canada)
Addition Silicone	Express (Regular)	3M (Canada)
Addition Silicone	Perfourm (C.D.)	Miles/Bayer (Canada)
Addition Silicone	Extrude (Extra)	Kerr Canada Manufacturing Co.
Addition Silicone	Extrude (Light)	Kerr Canada Manufacturing Co.
Addition Silicone	Reposil C.S. Type I (Med.)	Caulk/Dentsply (Canada)
Addition Silicone	Unosil - S	Caulk/Dentsply (Canada)
Polyether	Impregum (Type I)	Espe/Premier (Canada)
Polyether	Polygel - NF	Caulk/Dentsply (Canada)
Polysulfide	Permlastic (Light)	Kerr Canada Manufacturing Co.
Polysulfide	Permlastic (Heavy)	Kerr Canada Manufacturing Co.

seconds. Since the dash is in a closed-chamber system, the impression material below the dash has to flow around the dash into the upper part of the pot on the down stroke. Conversely, the material in the upper part of the pot must flow around the dash into the lower part of the pot on the up stroke.

As the polymerization reaction progresses, the viscosity also increases, thereby increasing the resistance or force required for the excursion of the dash versus time. Recording this change in force with each cycle, with a chart speed of 20 mm/min, provided a trumpet shaped curve (Fig. 2). The upper portion of the curve represents the force required on the up stroke of the dash, while the bottom half represents the force required on the down stroke. The two portions of the chart are near mirror images. Connecting the points of each cycle in the up-stroke portion of the chart provides an uncluttered profile of the change in polymerization rate/viscosity of the respective materials tested.

The working time was determined by drawing a tangent to the trumpet shaped curve. The point where this curve departs from the tangent was considered to be the time when the development of elastic properties began, and thus

the end of working time. This actual time is then read directly by dropping a vertical line from that point to the time axis.

Graphs were designed and curves nested to illustrate the development of elastic properties (i.e., end of working time) for a number of the materials tested (Figs. 3-6). Baysilex (Mono), Imprint (S.Ph Syringe), Perfourm (C.D.), Perfourm (Med), Reprosil C.S. Type I (Med) and Unosil-S were treated and graphed in a similar fashion, but were not included in the figures for brevity sake. However, these results are included in Table II.

Each material was tested five times at three different temperature conditions.

Condition 1: Materials were mixed at room temperature (20°C) and placed in the dash-pot assembly, which was also at the room temperature.

Condition 2: Materials were stored for 24 hours in a refrigerator at 6°C, mixed at room temperature, and placed in the testing apparatus at 20°C.

Condition 3: Materials were mixed at room temperature (20°C) and then placed in the testing apparatus, which had been heated to 35°C to simulate mouth temperature.

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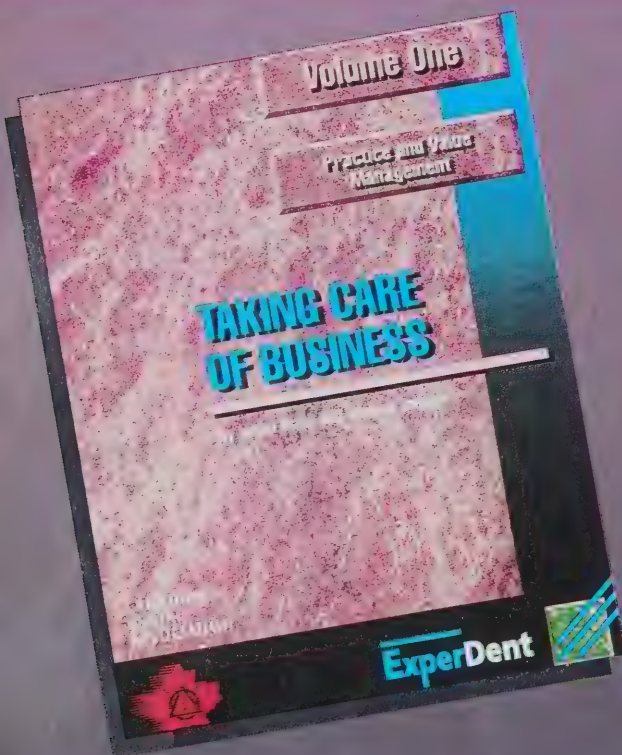


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11 Year Graduate

"I have just completed my review of Taking Care of Business, Volume I and I want to say that Practice Management and Value Appraisal is outstanding. Magnificent comes to mind. I am aware of no source for similar material that is as all encompassing, thorough and timely."

Duncan, B.C.
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This year, the Canadian Dental Association in partnership with ExperDent Consultants, will launch "Taking Care of Business", its unique new Practice Management Program for both new grads and established members of the profession. Two volumes of Program materials and practical information will be available to CDA members on:

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Results

Condition 1

Materials tested at room temperature (20°C) demonstrated working times similar to the manufacturer's information. The polysulfide (Permlastic) demonstrated the longest working times and the silicone (Imprint) the shortest.

Condition 2

All the materials stored for 24 hours at 6°C had longer working times. The silicones (Extrude light) had the greatest increase in working time (56 per cent). However, this extension in working time was not universal for all the silicone materials — two of them demonstrated only a five to eight per cent increase in working time (Express Light and Extrude Extra).

The polyether materials (Impregum and Polygel) were unusable following storage at this temperature. They became solid and it was impossible to express the material from the hardened collapsible tubes.

Condition 3

When the testing apparatus and immediate environment were heated to mouth temperature (35°C) (using flood lamps positioned at an appropriate distance), the working time for all materials was reduced. A number of the silicone materials (Extrude Extra and Unosil S) and one of the polyethers (Polygel - NF) set so fast that the testing apparatus could not record the end of the working time accurately. These materials set within 30 seconds of placement in the dash-pot. Thus, practically speaking, these materials will begin to set within 30 seconds of placement on the tooth preparation. The results are summarized in **Table II**.

Discussion

Working times are influenced by temperature and humidity and may also be influenced by the manner of testing. In all the test methods reported to date, it is assumed that any change in viscosity with time will be uniform throughout the mass of the impression material, including the surface. If the freshly-mixed surface is adversely affected

Table II

Results

Brand	$\bar{X} \pm S.D. @ 20C$	$\bar{X} \pm S.D. @ 6C$	$\bar{X} \pm S.D. @ 35C$
Perfourm (Medium)	3.34 ± 0.21	3.75 ± 0.35	<1.00
Baysilex (Mono)	3.16 ± 0.42	3.90 ± 0.29	1.65 ± 0.14
Express (Light Syringe)	4.22 ± 0.08	4.45 ± 0.37	1.18 ± 0.13
Imprint (S.Ph Syringe)	2.26 ± 0.43	3.50 ± 0.31	1.13 ± 0.01
Express (Regular)	4.38 ± 0.19	5.11 ± 0.41	1.25 ± 0.00
Perfourm (C.D.)	2.68 ± 0.18	3.15 ± 0.34	1.05 ± 0.11
Extrude (Extra)	2.45 ± 0.11	2.65 ± 0.14	<1.00
Extrude (Light)	3.00 ± 0.35	4.70 ± 0.27	1.48 ± 0.04
Reprosil C.S. Type I (Med.)	2.80 ± 0.21	3.55 ± 0.48	1.12 ± 0.16
Unosil - S	2.80 ± 0.11	3.95 ± 0.41	<1.00
Impregum (Type I)	3.08 ± 0.11	—	1.80 ± 0.14
Polygel - NF	2.85 ± 0.14	—	<1.00
Permlastic (Light)	5.75 ± 0.00	6.40 ± 0.68	3.14 ± 0.13
Permlastic (Heavy)	4.25 ± 0.31	5.70 ± 0.27	2.26 ± 0.18

by the environmental conditions, i.e., atmospheric oxygen, and the polymerization reaction is retarded at the surface, then the "setting" will not be uniform throughout the mass. The test procedures reported to date that depend on indentation, penetration or the damping of an oscillating stylus on the surface of the impression material may not provide the best measurement of the working time.

The results obtained using this new method for measuring the working time would appear to be comparable with the information provided by the manufacturers for room temperature (20°C). This methodology does not require specialized equipment, as previous studies have described. The Instron Tensile Testing apparatus is now standard equipment and a simple dash-pot may be easily machined at minimal cost.

As stated previously, the working time begins with the start of mixing and ends when the impression material begins to develop elastic properties. However, this definition was established when materials were customarily dispensed from tubes and spatulated on a pad to the correct homogeneity. Should working time be now redefined with the introduction of the "automix technique"? Working

time might better be defined as the time from the end of mixing to the time when the impression material begins to develop elastic properties. In this way, impression materials mixed by hand according to manufacturer's recommendations could be directly compared to the automixed samples.

The dramatic reduction in the working times of many of the silicones, when placed in the testing apparatus at 35°C, might explain the technique sensitivity of this group of materials. It mitigates against using a compressed air stream to adapt the material below the margin of a tooth preparation. Because of the rapid rate of polymerization, the near-set material may peel away when air is used for adaptation.

Conclusions

Under the test conditions outlined, it is easy to evaluate the working times of various elastomeric impression materials. These results are comparable to the manufacturer's test results.

At room temperature (20°C), the polysulfides material, Permlastic Light, demonstrated the longest working time. All the polysulfides and the silicones had longer working times following storage for 24 hours at 6°C. The polyethers were

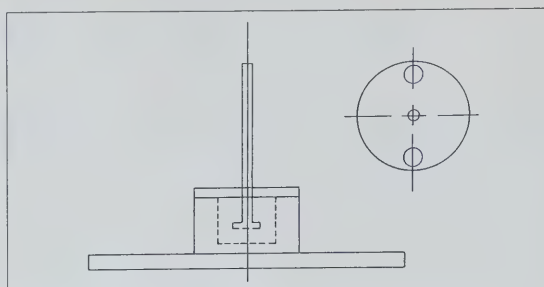


Fig. 1: Dash-pot assembly for determining working times.

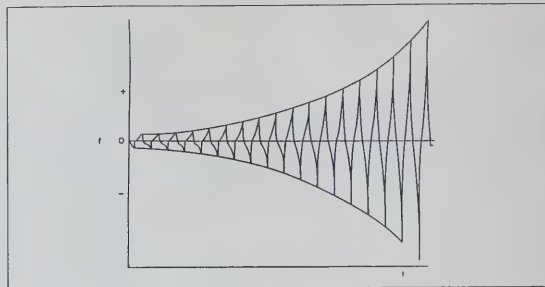


Fig. 2: Cyclic recording of force vs. time.

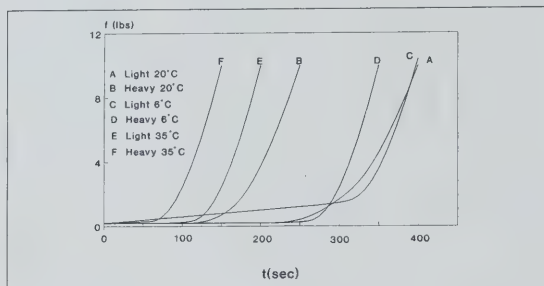


Fig. 3: Polysulfide (Permalastic).

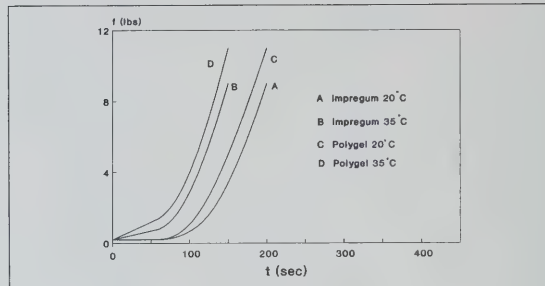


Fig. 4: Polyethers.

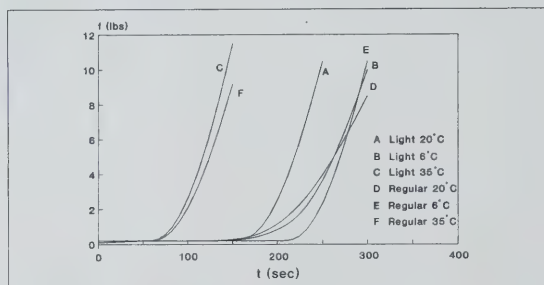


Fig. 5: Express (Automix).

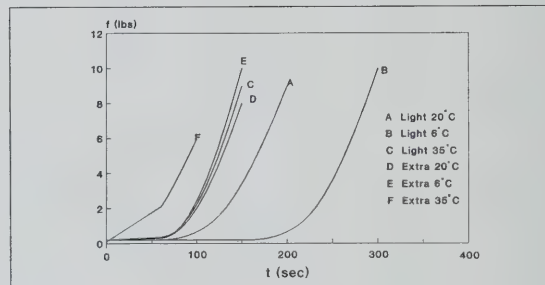


Fig. 6: Extrude (Automix).

unusable when stored at this temperature. When the testing apparatus was heated to mouth temperature (35°C), all the materials tested demonstrated a reduction in working times. This reduction was least for the polysulfides. ■

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Intracoronary Bleaching: Concerns and Considerations

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ABSTRACT

The history of intracoronary bleaching and the development of the walking bleach technique are reviewed. External cervical resorption associated with intracoronary bleaching is a serious sequela that has been reported in the literature. One explanation given for this phenomenon is that it results from an inflammatory process initiated by the presence of bleaching agents in the attachment apparatus. The basis for this conclusion is discussed. A review of published case reports on external cervical resorption associated with intracoronary bleaching revealed that: 100 per cent of the affected teeth had no intermediate dental base placed, 84 per cent were treated with a thermocatalytic technique, 80 per cent were bleached after the root canal sealer was fully set and 72 per cent had a history of trauma before bleaching. Based on these observations, it should be possible to safely bleach teeth intracoronally provided specific concerns and considerations are taken into account. These are: 1) the use of heat should be avoided; 2) an intermediate dental base should be placed with due respect to the attachment level; and 3) a base should be selected with due respect to its effectiveness in sealing tooth structure.

SOMMAIRE

Dans cet article, on raconte comment les techniques de blanchiment intracoronaire et de blanchiment progressif ont été mises au point. La résorption cervicale externe associée au blanchiment intracoronaire est une séquelle sérieuse que plusieurs publications ont signalée. Suivant une des explications fournies à ce sujet, cette résorption proviendrait d'une inflammation causée par les agents de blanchiment compris dans l'attachement. On commente les principes de cette conclusion. Une revue des cas publiés de résorption cervicale externe associée au blanchiment intracoronaire a révélé que : pour 100 p. cent des dents atteintes, aucune base dentaire intermédiaire n'a été placée; 84 p. cent ont été traitées suivant une technique thermocatalytique; 80 p. cent ont été blanchies après le durcissement complet du produit de scellement des cônes d'obturation radiculaire; et 77 p. cent avaient subi un traumatisme avant le blanchiment. D'après ces observations, on devrait pouvoir opérer sans danger le blanchiment intracoronaire des dents à la condition de tenir compte de considérations et de points précis : 1) éviter la chaleur; 2) placer une base dentaire intermédiaire en tenant compte du niveau d'attachement; et 3) choisir une base en fonction de son efficacité à sceller la structure de la dent.

Introduction

Undeniably, the bleaching of endodontically-treated teeth is of esthetic benefit to many patients. This esthetic benefit is, however, not without risk. External cervical root resorption as a sequela to intracoronary bleaching has been reported by many authors. Some authors view the possibility of resorption as being sufficient to preclude their endorsement and encouragement of the bleaching procedure.

Evolution of the Walking Bleach Technique

One of the first reports on restoring natural color to pulpless teeth was offered in 1877 by J.A. Chapple,¹ who advocated the use of oxalic acid. A.W. Harlan, in 1884, was perhaps the first researcher to advocate the use of hydrogen peroxide for intracoronary bleaching.² The concept of activating the bleaching agent to expedite the process was introduced in 1895 by Albert Westlake,³ who reported the use of an electrical current and pyrozone. In 1911, Pierre Rosenthal became the first researcher to activate a bleach with light, which was provided by the ultraviolet rays released from a mercury vapor lamp.⁴ C.L. Brinstool, in 1913, was the first to suggest the use of heat intracoronally with pyrozone, employing an electric root canal drying point.⁵ In 1918, C.H. Abbot was

the first to introduce the use of superoxol — then known as perhydrol, a 30-per-cent solution of hydrogen peroxide in water — and electric light rays.⁶ In 1924, Henry Prinz⁷ suggested that a saturated solution of sodium perborate and hydrogen peroxide, along with superoxol and an electric lamp, could be used.

Until 1959, state of the art intracoronary bleaching involved the use of superoxol or pyrozone (25-per-cent hydrogen peroxide in ether), and heat and/or light activation. A bleach-saturated cotton pellet was placed in the tooth between visits.⁸ In 1961, Spasser⁹ reported clinical success using perborate, which he mixed to a paste consistency with water and placed in the tooth between visits. Perborate in this form breaks down gradually between visits into hydrogen peroxide, allowing for a sustained release of bleaching agent. Nutting and Poe,¹⁰ in 1963, were the first to describe the walking bleach technique as "A New Combination for Bleaching Teeth." They were motivated to develop the technique because of the inconvenience and amount of time required to use heat lamp activation. At first, the walking bleach technique only involved the simple placement of a superoxol-saturated cotton pellet in the tooth between visits. Nutting and Poe achieved satisfactory results using their new technique. However, on learning of Spasser's report, they decided to combine the two techniques into what today is commonly referred to as the walking bleach technique.

Nutting and Poe described the new technique, which involved placing a superoxol and perborate paste in the tooth, without the use of a heat lamp, as being "clinically effective, simpler and less time consuming than currently popular techniques." Subsequent to their report, many articles¹¹⁻²² proposing various combinations of previously-reported materials and techniques have appeared. Notably, in 1980, Howell¹² reported on the use of 30-per-cent phosphoric acid to open the dentinal tubules before placing the bleach. With respect to *in vitro* intracoronary

bleaching, no difference in efficacy has been reported in comparisons of: 1) heat-activated, aqueous 30-per-cent H₂O₂; 2) heat-activated 30-per-cent H₂O₂ and perborate; and, 3) 30-per-cent H₂O₂ and perborate.¹¹ It has also been reported that there is no difference, *in vitro*, between: 1) three-per-cent H₂O₂ and perborate; and, 2) perborate and water.²³ In addition, it has been reported that, *in vitro*, 30-per-cent H₂O₂ and sodium perborate is almost twice as effective as sodium perborate and water.¹⁴ To date, there is little agreement among the textbook authors with respect to a specific protocol for non-vital bleaching. The areas of consensus include insuring an adequate root canal filling, replacing faulty restorations, and protecting the adjacent soft tissues before initiating the bleaching process. In the third edition of *Endodontics*, Ingle and Tainter²⁴ recommend removing as much stained dentin as possible, as well as removing any root-canal filling material to well below the level of the labial gingivae before bleaching. Next, they recommend using 30-per-cent orthophosphoric acid, followed by sodium hypochlorite, followed by 95-per-cent alcohol or acetone to completely remove the smear layer and dehydrate the chamber walls. Then, a thick paste of superoxol and sodium perborate is placed, and the tooth is temporized using a cotton pellet and Cavit. Ingle and Tainter recommend evaluating the tooth color at five-day intervals, replacing the bleaching chemicals as necessary.

In the fifth edition of *Pathways of the Pulp*, Cohen and Burns²⁵ relate both an in-office bleach technique, using a 35-per-cent hydrogen peroxide-saturated cotton matrix with heat, and a walking bleach technique. For both techniques, they recommend removing all chamber debris, as well as a surface layer of dentin, before removing the root canal filling material to a depth of 2.0 to 3.0 mm apical to the cervical line. Next, they place a layer of zinc oxyphosphate cement or the equivalent to a level 1.0 to 2.0 mm coronal to the cemento-enamel junction. Any visible stain is then

removed with a bur prior to swabbing the entire preparation with 70-per-cent isopropyl alcohol and drying. Either impregnated cotton or a thick paste of sodium perborate and 35-per-cent hydrogen peroxide is then placed in the chamber, leaving enough space for a temporary restoration. The patient is evaluated five days later to assess the color suitability.

Tronstad, in *Clinical Endodontics*,²⁶ relates both heat and walking bleach techniques. After removing the root filling to a level below the gingival margin, a resin-reinforced zinc oxide-eugenol cement base is placed. Remnants of materials and severely discolored dentin are then removed with a number 2 round bur, and the entire tooth is acid etched for 60 seconds using 37-per-cent phosphoric acid gel. After copious water rinsing, the tooth is dehydrated with compressed air, absolute alcohol, and chloroform. Tronstad's bleaching procedure is performed with three-per-cent hydrogen peroxide and heat or a walking bleach using sodium perborate and three-per-cent hydrogen peroxide. He recommends a follow-up appointment in about one week.

The thermocatalytic technique in its most basic form involves placement of a hot metal instrument into the bleach in the pulp chamber prior to closing the tooth. The effects of this heat should be two fold: 1) catalysis of the breakdown of the bleaching agent into its unstable oxidizing components; and, 2) imparting energy to the bleach solution, which may cause it to expand and diffuse more effectively into the dentin tubules of the stained tooth structure.

Cervical Resorption Associated with Intracoronary Bleaching

In 1979, Harrington and Natin²⁷ first reported on a resorptive phenomenon in human teeth that may be related to bleaching chemicals diffusing through the patent dentinal tubules into the cervical periodontal ligament. They speculated that a tissue reaction, resulting from the presence of bleach, may have given rise to inflamma-

tory resorption. At the time, their conclusions were supported by dye studies done by Anderson and Ronning,²⁸ which showed that dye would diffuse through the dentinal tubules to the periphery of the tooth in recently extracted teeth. Since Harrington and Natkin's original report was published, many authors²⁹⁻⁴⁰ have reported similar clinical case presentations and come to similar conclusions. Friedman et al reported on the incidence of cervical resorption in 58 bleached pulpless human teeth.³⁷ All teeth had the root fill removed below the attachment level and were bleached with thermocatalytic aqueous 30-per-cent H₂O₂. No base was placed. Friedman et al found a 6.9-per-cent incidence of clinical external cervical resorption (four of the 58 teeth examined).

Experimentally, Madison and Walton⁴¹ induced histological cervical resorption in their dog bleaching study. Three techniques were employed: 1) thermocatalytic 30-per-cent H₂O₂; 2) 30-per-cent H₂O₂ and perborate paste-walking bleach; and, 3) techniques 1 and 2, together. No intermediate dental base was placed, and pulp chambers were etched prior to bleach placement. The combination of heat and 30-per-cent hydrogen peroxide was associated with resorption, but none of the teeth receiving walking bleach alone demonstrated resorption. Madison and Walton concluded that resorption was not related to walking bleach or to internal etching alone.

Heller et al⁴² also induced histological cervical resorption in dogs receiving intracoronal bleaching. The teeth were endodontically treated and a walking bleach of superoxyl and perborate was placed without heat. No base was placed. Two of the 16 teeth in the experimental group showed evidence of resorption in the area of connective tissue attachment above the level of root fill removal. Heller concluded that this resorption was most likely caused by the diffusion of the bleaching agent through the dentinal tubules to the cementum and/or periodontal ligament. She also suggested that re-

sorption occurred in her study, and not in Madison and Walton's, since the bleach remained in the tooth longer in their study.

Rotstein et al⁴³ histologically characterized bleach-induced cervical resorption in dogs and concluded that it was an inflammatory process. A thermocatalytic aqueous H₂O₂ technique, with no base, was employed. Histologically, the lesions were associated with inflammatory tissue in the periodontal ligament. Rotstein et al concluded that since H₂O₂ is very unstable and since inflammatory resorption was still underway six months after bleaching, that the bleach itself was not responsible for the resorption. It was suggested that toxic radicals or protein denaturants were released in the attachment from the initial presence of the bleach. These substances are hypothesized to have induced and perpetuated the inflammatory process that caused cervical resorption. Another of Rotstein et al's findings was that filling canals with calcium hydroxide after bleaching had no effect on reducing the resorption process. This finding is supported by the *in vitro* study of Fuss et al,⁴⁴ which concluded that calcium hydroxide did not pass through the dentinal tubules to the root surface, yet bleach did. It is reasonable to assume, based on reports of cervical resorption, that the presence of bleach in the attachment could cause local necrosis followed by inflammation and root resorption.

In Vitro Investigations Related to Cervical Resorption

A number of investigators have reported on *in vitro* studies that relate to intracoronal bleaching. These investigations fall into three categories: 1) direct chemical or photochemical assays to detect the presence of bleach; 2) indirect dye studies to demonstrate the presence of bleach; and, 3) determinations of the seal effectiveness of intermediate dental bases. Another variable that is sometimes considered is the timing of bleach placement with respect to root canal filling and/or base placement.

Bleaching may begin either immediately following root filling and base placement or delayed. Clinically, two appointments versus one would be required if bleaching begins at the same time as root filling and base placement. These studies point out the effects of allowing a prolonged setting reaction in the materials chosen as a root canal sealer and base.

An early dye investigation by Parris and Kapsimalis⁴⁵ reported on how temperature affects the sealing properties of temporary filling materials. They compared gutta percha, zinc phosphate, zinc oxide and Cavit in normal saline, and found that Cavit was the only material that did not leak. In a similar study, Tamse et al⁴⁶ compared the sealing ability in saline of two categories of temporary filling materials: zinc oxide eugenol-based (e.g. IRM) and calcium sulfate-based materials (e.g. Cavit). The calcium sulphate-based materials were found to be superior.

The first chemical assay to demonstrate the diffusion of bleaching agent through patent cervical dentinal tubules, with cementum removed, was undertaken by Fuss et al.⁴⁴ Human teeth were root filled below the cemento-enamel junction, bleach or calcium hydroxide was placed, and the teeth were surrounded in distilled water. The pH in the distilled water surrounding the teeth was then measured. It was found that bleach passed through the tubules, lowering the pH, but calcium hydroxide did not. Rotstein has developed an *in vitro* model, using a photochemical assay, to quantify bleach diffusion. In one study,⁴⁷ artificial cervical cementum defects were produced and the diffusion of bleach into a surrounding medium was quantified. A thermocatalytic, aqueous, 30-per-cent H₂O₂ technique was used. It was found that up to 82 per cent of the H₂O₂ applied inside the tooth ended up in the surrounding medium. In another study, Rotstein⁴⁸ compared a similar group of teeth with cementum defects to a group with entirely intact cervical cementum. He found that bleach diffused into the medium surrounding all teeth, but that it was signifi-

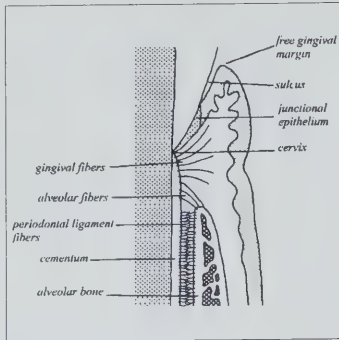


Fig. 1: Anatomic cervix coincident with attachment apparatus.

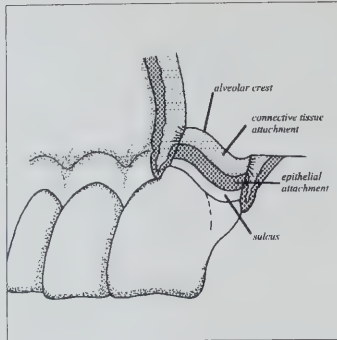


Fig. 2: Biologic width, attachment coincident with alveolar crest.

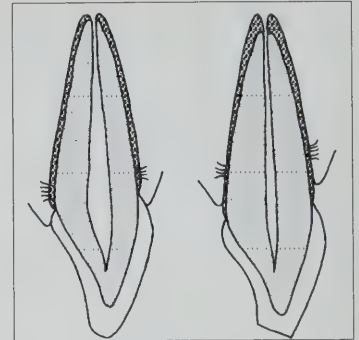


Fig. 3: Relative longitudinal effects of passive eruption and inflammation on attachment level.

cantly less in the group with no cementum defects. In another study using the same photochemical model, Rotstein et al⁴⁹ reported on bleach permeability, using various base materials, base thicknesses, and base placement locations. In the bovine tooth group, the bases tested included IRM, ZOE, composite and glass ionomer. Apical leakage past the base was assessed. In the human tooth group, only IRM was used. It was placed either at or below the cementoenamel junction, and leakage to the root surface was assessed. Bleaching agent was placed in all teeth for one hour and incubated in dry heat. Rotstein et al concluded that a base thickness of 2.0 mm in the bovine group prevented leakage, regardless of the material being tested. When base thickness was reduced to 1.0 mm, however, all bases tested showed leakage in some instances. In the human tooth group, it was concluded that a base placed at the cementoenamel junction significantly reduced bleach permeability when compared to a based placed 0.5 mm below the junction. In fact, when base was placed below the junction, bleach permeability was the same as if no base was placed. DePerla et al⁵⁰ evaluated the apical leakage of a Superoxyl, sodium perborate and dye solution through a 1.0 mm IRM intermediate base. They concluded that there was no significant difference in the amount of leakage observed with or without an IRM base when the bleaching was initiated immediately after canal obturation. Since there was a significant reduction in leakage if the bleaching process was delayed

for seven days, they concluded that the most critical step in the prevention of apical bleach leakage is allowing the root canal sealer to reach final set. These findings imply that a 1.0 mm IRM base provides no barrier to apical leakage of bleach. Smith and Cunningham,⁵¹ in a dye study, found more leakage between the canal wall and the sealer after complete set of the sealer, however. It was suggested that this may be due to the sealer contracting on setting. The main conclusion of Cunningham and Smith was that a 2.0 mm base of cavit significantly reduces linear leakage and dentin permeability compared to the use of no base, and that letting the materials set made no significant difference.

Anatomic Considerations Related to Cervical Resorption

Anatomic considerations relate to the physical passage of bleaching agent from within the tooth to the attachment apparatus. The importance of anatomic considerations is that pluripotential mesenchymal cells capable of tooth resorption are members of the attachment population, and must be acted on by bleach originating from within the root canal system. The potential source of these cells are: 1) cementum; 2) gingival connective tissue; and, 3) periodontal ligament. It is important to define specific dental anatomic terms, versus periodontal histologic terms, as they relate to clinical cervical resorption.

Clinical cervical resorption is a manifestation of a histologic proc-

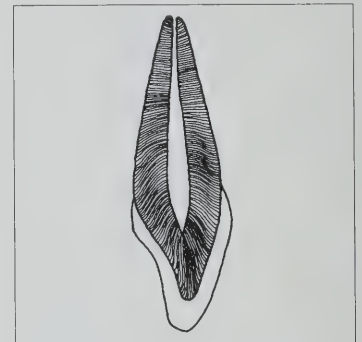


Fig. 4: Course of tubules from pulp chamber to root surface.

ess where connective tissue and/or periodontal ligament inserts into tooth structure. This insertion may or may not coincide with the anatomical cervix or cementoenamel junction (Fig. 1). The literature emphasizes the cementoenamel junction, the gingival line, the cervical line, and the gingival margin when referring to base placement. In effect, the attachment apparatus, i.e. those tissues that insert into tooth structure, may be considered to start where the gingival connective tissue inserts into cementum, and continue apically into the periodontal ligament. The level of attachment is generally curvilinear, rather than linear, and coincides with the level of supporting alveolar bone (Fig. 2).

Biologic width is a concept that characterizes the consistent nature and architecture of the cervical attachment.⁵² It consists of the epithelial attachment and connective tissue attachment. On average, it is 2.04 mm wide. The most consistent zone of the biologic width is the connective tissue attachment,

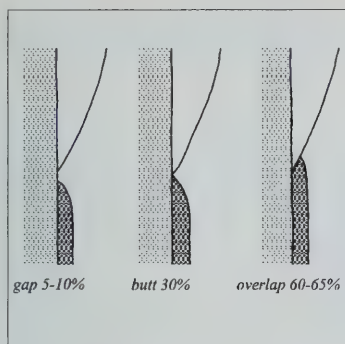


Fig. 5: Potential configurations and incidence of cementodentoenamel junctions.

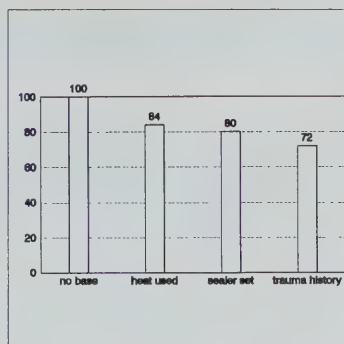


Fig. 6: Case reports of bleach-related cervical resorption and known parameters.

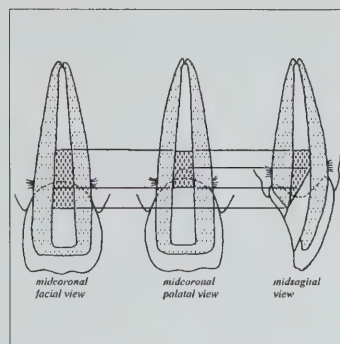


Fig. 7: Ideal placement of base in cross section with respect to attachment.

which averages 1.07 mm wide and is parallel to the alveolar crest (**Fig. 2**). The attachment apparatus is not a static entity, but rather a dynamic one that changes with time. It is influenced over time by inflammation and passive eruption (**Fig. 3**).

Since the conduit for bleach diffusion between the root canal and the attachment is the dentinal tubule, one should consider its anatomy, course and orientation. Starting on the root surface or dentoenamel junction, these tubules course medially and apically as a sigmoid curve to the canal wall (**Fig. 4**). It is known that both the patency of the tubule lumen⁵³ and permeability⁵⁴ decrease with age. Since cementum can act as a deterrent to the diffusion of bleach,⁴⁸ its characteristics should be considered. Cementum's permeability⁵⁵ and cellularity decrease with age and its thickness increases.⁵⁶ It has been shown that the cementum of non-vital teeth is 1/10th as permeable as that of vital teeth.⁵⁷ It is reasonable that the tooth of a younger patient is more likely to allow bleach to gain access to the attachment, through the cementum, than the tooth of an older patient.

Next, consider the anatomic features of the cementsoenamel junction. The classic report on the natural configurations and the incidence of the relationship between dentin, cementum and enamel are shown in **Fig. 5**.⁵⁸ More recent histologic studies of the cementsoenamel junction indicate that healthy anterior teeth may exhibit cemental defects and exposed dentin 25 per cent of the time.⁵⁹ Anatomy is relevant to intracoronal

bleaching in that the selection of an appropriate anatomic location for the placement of an intermediate dental base is essential. With these considerations in mind, optimum placement is dictated by: 1) the successful bleaching of the clinical crown; and, 2) the exclusion of bleach or protection of the attachment apparatus.

Rational for a Clinical Intracoronal Bleaching Protocol

Regardless of the bleaching technique used, the exclusion of bleaching agent from the attachment apparatus should be viewed as a reasonable and primary objective. A review of the literature supports this conjecture. All case reviews of cervical resorption for which the clinical history and technique parameters are known (25 teeth), as reported in the literature, are summarized in **Table I**.

A number of critical clinical considerations should be taken into account before contemplating the intracoronal bleaching of any tooth. These considerations may be directly responsible for the potential action of bleach on the attachment apparatus. They are: 1) placement of intermediate dental base; 2) use of a thermocatalytic technique; 3) timing of bleach placement with respect to root filling; and, 4) clinical history of the tooth. **Fig. 6** summarizes the relationship between these variables and the incidence of reported cervical resorption. A correlation between these variables and the occurrence of cervical resorption is evident. Specifically: 1) an inter-

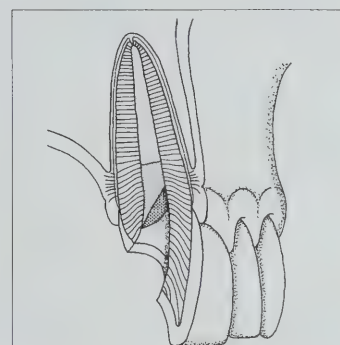


Fig. 8: Ideal placement of an intermediate dental base for intracoronal bleaching.

mediate dental base was never placed; 2) there is a correlation with the use of a thermocatalytic technique; 3) there is a low correlation with respect to whether bleaching is delayed after root filling; and, 4) a clinical history of trauma correlates with the incidence of cervical resorption. If no intermediate dental base is placed, there is no attempt made to exclude bleaching agents from the attachment apparatus. If a thermocatalytic technique is employed, bleaching agents may be more likely to end up in the attachment apparatus in higher concentrations. It appears to make little difference if bleaching is delayed after root filling. This implies that a root filling is an inadequate barrier to bleach on its own, even if the time allowed for the seal to set is prolonged. If the tooth has a history of trauma, the incidence of resorption is high. This trend points out the importance of trauma-induced inflammatory surface resorption and its potential effect on the quality and quantity of cementum at the



Table I

Case Reports of Cervical Resorption Associated With Intracoronary Bleaching and Known Parameters of Clinical History.

Case Report	No. of teeth	Sealer set	Superoxyl	Sodium perborate	History of trauma	Thermo-catalytic	Intermediate base
Harrington ²⁷	4	+	+	+	+	+	-
Goon ³¹	1	+	+	+	+	-	-
Latcham ²⁹	1	+	endoperox	endoperox	+	-	-
Latcham ³²	1	+	endoperox	endoperox	+	-	-
Friedman ³⁷	2	?	+	+	-	+	-
Friedman ³⁷	1	?	+	+	-	+	-
Friedman ³⁷	1	?	+	+	-	-	-
Gimlin ⁴⁰	1	?	+	+	+	+	-
Lado ³⁴	1	+	+	+	-	+	-
Al-Nazham ³⁵	1	+	+	+	-	+	-
Cvek ³⁸	10	+	+	+	+	+	-
Cvek ³⁸	1	+	+	+	-	+	-
Montgomery ³³	1	?	?	?	+	?	?
Friedman ³⁶	3	?	?	?	?	?	?

cervix. With these observations in mind, it is possible to make rational recommendations for an intracoronary bleaching protocol that may reduce the potential risk of associated cervical resorption:

- Place an effective intermediate dental base. Its placement is related to the successful bleaching of the facial clinical crown, and serves to protect the attachment apparatus (Figs. 7 and 8).
- Etch the pulp chamber with 30-per-cent phosphoric acid to eliminate the smear layer and open the tubules to bleach.
- Attempt to achieve acceptable results without the use of heat. The aggressiveness of bleaching technique ranges from thermo-catalytic aqueous 30-per-cent H₂O₂ to perborate and water. First, attempt color correction with a walking bleach of superoxyl perborate paste, repeating at five-day intervals, as required.
- Bleaching may begin at the same appointment as root filling and base placement.
- Be aware that a history of trauma to the tooth may increase the

likelihood that resorption will occur.

Selection of an Ideal Intermediate Dental Base

A review of the literature reveals that the intermediate dental bases examined to date have a considerable potential for microleakage of bleaching agents. The issue with respect to intermediate dental base failure is related to degree. These observations bring to bear an important question related to intracoronary bleaching, namely, what criteria should be considered in selecting an intermediate dental base.

Ideally, an intermediate dental base for excluding bleaching agents from the attachment apparatus and enhancing long-term success will:

- 1) be simple to place precisely within the confines of the root canal/pulp chamber;
- 2) bond to tooth structure;
- 3) exhibit no polymerization shrinkage;
- 4) have a coefficient of thermal expansion the same as dentin;

- 5) be polymerized at the time of placement;
- 6) be resistant to dissolution by bleaching agents;
- 7) contain no eugenol to potentially affect polymerization of a subsequently-placed composite restoration;
- 8) bond to a subsequently placed composite restoration; and,
- 9) be of an esthetic shade and not likely to discolor tooth structure with time.

Perhaps the ideal base does not exist. Regardless, we must assess any material we are using as a bleaching adjunct with these ideal properties in mind. The most recent generation of dental materials, namely the glass ionomer/composite resin hybrids, intuitively appear to meet the ideal criteria and, furthermore, have not been investigated for use as an intermediate dental base for intracoronary bleaching. These materials can be mixed in a range of powder to liquid ratios that provide a range of consistencies. This may facilitate the individual operator's ability to precisely and easily place the base. These materials can be photo-cured at the time of placement, and



have a high bond strength to dentin. Polymerization shrinkage is nil. Their coefficient of thermal expansion is very close to that of dentin. The materials are esthetic, contain no eugenol, and bond to composite resins.

Conclusion

Based on a review of the literature on bleach-related external cervical resorption, a sound deductive argument can be made for safe intracoronal bleaching — provided appropriate concerns and considerations are addressed. This conclusion is based on the fact that in the cases of resorption reported to date, no base was placed, a thermocatalytic technique was used in the majority of cases, and many of these patients had a history of trauma prior to bleaching. The minimum requirement is the placement of an effective intermediate dental base, which must be situated in a manner that will exclude bleach from the attachment apparatus. The use of a thermocatalytic technique should be avoided, since it may greatly increase the risk of external cervical resorption. The patient should be questioned regarding the history of the tooth, as a history of trauma may increase the possibility of resorption associated with bleaching.

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TABLE 1

Dosage in capsules of Rovamycine '250'	
Body weight	(750,000 I.U. Spiramycin/capsule)
15 kg	3 capsules/day
20 kg	4 capsules/day
30 kg	6 capsules/day

absorption is not affected by food. In severe infections, the daily dosage may be increased by one half. In the treatment of beta-hemolytic streptococcal infections, adequate spiramycin dosage should be administered for 10 days. **SUPPLIED: Rovamycine '250':** Each orange and red capsule contains: 750,000 I.U. of spiramycin. Tartrazine-free. Bottles of 50. **Rovamycine '500':** Each grey and red capsule contains: 1,500,000 I.U. of spiramycin. Tartrazine-free. Bottles of 50.

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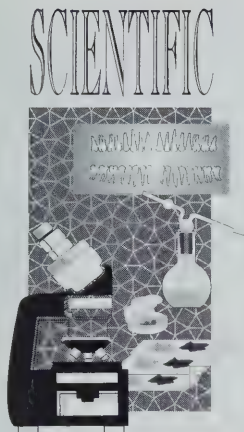
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Stress Situations in Dental Practice

M. Bourassa, PhD

J.F. Baylard, DMD

ABSTRACT

Several studies indicate that stress is inherently present in dental practice. The present study was conducted to help identify the factors underlying this stress and the relative contribution of each factor.

A questionnaire presented participating dentists with 52 potentially-stressful situations related to dental practice. Respondents were asked to rate each situation on a five-point scale, using a range of responses that varied from "not stressful" to "exceedingly stressful," and "I don't know" to "not applicable." The present data are based on the ratings given by the 1,332 dentists practising in Québec who answered the questionnaire (52 per cent).

Ten situations received a mean score of greater than 3.0, and were therefore considered as above average stress-producing situations. The majority of these situations could be classified as being related either to dental procedures and office organization or to interpersonal relationships involving patients and/or office personnel. It was found that the older age groups showed significantly less stress for six of the 10 most stressful situations.

This study has indicated the specific situations that most frequently lead to stress in dentists. The precise identification of these situations could lead to reduced

stress through the elimination of its vague and insidious character. Furthermore, an understanding of the most common stress-causing situations allows the practitioner to take preventive measures to eliminate its damaging effects in the dental practice.

SOMMAIRE

De nombreuses études révèlent que le stress se retrouve habituellement dans tous les cabinets de dentiste. Aussi cette étude a-t-elle été faite dans le but de déterminer les facteurs qui causent ce stress et l'importance relative de chacun.

Dans un questionnaire, on a présenté à des dentistes 52 situations différentes qui, en dentisterie, peuvent être stressantes. On leur a demandé de noter chaque situation suivant une échelle de cinq points, les réponses allant de non stressant à très stressant et de je ne sais pas à ne s'applique pas. Les données obtenues sont basées sur les réponses des 1 332 praticiens dentaires québécois qui ont rempli le questionnaire (52 p. cent).

Dix situations ont obtenu une note moyenne supérieure à 3,0, ce qui les range dans les situations stressantes supérieures à la moyenne. La plupart d'entre elles peuvent être classées comme des situations reliées à des procédures dentaires et à l'organisation du cabinet ou à des relations interper-

sonnelles impliquant des patients ou des membres du personnel. On a découvert que les groupes les plus âgés éprouvent beaucoup moins de stress dans six des dix situations les plus stressantes.

L'étude a fait ressortir les situations particulières qui stressent le plus souvent les dentistes. En les déterminant, on pourra peut-être en éliminer le caractère vague et insidieux et, ainsi, les rendre moins stressantes. En outre, en comprenant les situations stressantes les plus communes, le praticien peut prendre des mesures de prévention afin d'en éliminer les effets dommageables pour son cabinet.

Introduction

For many years, opinions and studies have suggested that dentistry generates more stress than any other profession, primarily because of the nature and working conditions of the dental office. We must go beyond this simple acknowledgement to define the variables that are the basis of stressful situations in dentistry and, ultimately, provide practitioners with a means of protection against these factors, which may have a profound impact on their health.

Many studies have found the suicide rate of dentists to be unusually high. In California, for example, 7,471 suicides were committed between 1959 and 1961. The suicide rate for the general popula-

tion was 38 individuals per 100,000 per year, while the rate rose to 83 per 100,000 per year among dentists.¹ One report² stated that 2.03 per cent of the dentists who died between 1968 and 1972 were suicides — the rate for the general public in that same time was 1.1 per cent. Between 1957 and 1961, dentists had the highest suicide rate of all white collar workers in the United States (15.7/100,000).³ The suicide rate among male dentists in Ontario was significantly higher than the suicide rate of the overall male population over 25 years of age (5.23 per cent versus 1.87 per cent).⁴

Many other studies contradict these findings, however.⁵ One study⁶ states that from 1960 to 1965 there was no significant difference between the suicide rate for dentists and the suicide rate of the general white male population. Orner's 1960-1965 study⁷ of U.S. dentists showed that 73 per cent live until age 64 and beyond, that their death rate from all causes is lower than the death rate of the general population in all age groups, and that there are no specific causes of death. Hark⁸ reported that statistical data validating inherent psychological problems among dentists are a myth, and that dental stress has become so oversold and credible that many dentists can no longer distinguish between fact and fantasy.

One study suggested that coronary heart disease and hypertension, both related to stress,⁹ have a high incidence among dentists.¹⁰ Selye¹¹ found that chronic exposure to stress over a long period of time can have a serious impact on physical and mental health, and may actually shorten life. Another study¹² concluded that dentistry is a potentially stressful occupation. Gurtwirth¹³ reported that dentists are subject to more anxiety than other professionals (42.1 per cent versus 12.3 per cent). Sword's study¹⁴ concluded that the incidence of alcoholism, drug abuse and divorce is disproportionate in the dental profession.

Many studies have looked at stress factors in dentistry.¹⁵⁻¹⁸ One such study¹⁹ rated specific job pres-

Table I

List of the 10 Situations Receiving a Mean Score Higher Than 3.0

Stress Situation	Mean
The patient shows dissatisfaction toward the care he has received	3.66
Giving care to an uncooperative patient	3.46
Being behind schedule	3.41
Proceeding to a difficult unexpected operation	3.27
Assuming a heavy financial burden	3.25
Giving care to very anxious patients	3.23
Treating a complex case with unfavorable prognosis	3.23
Results of a job bringing only little satisfaction	3.23
You have difficulties obtaining good control of office management	3.05
Being overworked	3.01

Table II

List of Situations That Have At Least 0.5 Correlation With the Dimension: "Stress From Task and Organizing the Office"

Stress Situation	Weight
Patients not evaluating your work to its just value	0.57
You have difficulties obtaining good control of office management	0.57
Feeling physically and mentally isolated	0.55
Feeling, with years, that work is becoming routine	0.54
Feeling more and more a lack of intellectual stimulation	0.54
Assuming a heavy financial burden	0.54
Realizing that your treatments are not permanent	0.52
Having difficulties gaining confidence of patient	0.52
Patients having a different scale of values compared to yours	0.51

sures that contribute to a dentist's psychological and physiological problems. In order, they are:

- 1) trying to sustain and build a practice;
- 2) working too hard;
- 3) having administrative difficulties; and
- 4) having to cope with difficult patients.

The object of this study is to identify the main factors of stress in dental practice. Many definitions of stress were previously proposed, all of which are related to three different study models. The first model studies the physiological re-

sponses of the body to stress. The second model relies on the observation of behavioral and emotional responses to study stress. Finally, the study model used for this report, known as the "Michigan school," integrates the psychological and physiological aspects of stress in three assumptions. The first assumption suggests that the objective conditions of the work environment contribute to the psychological environment. The second assumes a relationship between the psychological environment and the immediate reactions it provokes. The third establishes a

**Table III****List of Situations That Have At Least 0.5 Correlation With the Dimension: "Stress From Interpersonal Relations"**

Stress Situation	Weight
Giving care to a patient with a physiological disease	0.65
Patients frightened of dentists	0.63
Giving care to mentally handicapped patients	0.62
Giving care to very anxious patients	0.61
Giving care to children under 5 years of age	0.59
Proceeding to a difficult unexpected operation	0.56
Facing an emergency	0.53
Giving care to elderly people	0.53
Giving care to physically handicapped patients	0.52
Treating an intricate case with unfavorable prognosis	0.52

link between the psychological situation and health criteria.

Materials and Methods

To evaluate stress, we used a questionnaire that included descriptions of 52 potentially-stressful situations related to a dental practice. Dentists were asked to rate each situation on a five-point scale, which allowed a range of responses from "not stressful" to "exceedingly stressful," and from "I don't know" to "not applicable."

The questionnaire was validated using a pre-questionnaire that described diverse stressful situations. These situations were submitted to a group of 56 consultant experts, who then selected the most pertinent situations for inclusion in the final questionnaire. This final questionnaire was sent to all 2,651 dentist members of the Order of Dentists of Québec, Québec's dental licensing body. The survey package included a pre-stamped return envelope and a letter explaining the study, and the anonymity of all respondents was assured.

Our sample is composed of 1,332 dentists, representing a 52 per cent participation rate. The majority graduated from Université de Montréal (83 per cent). Others graduated from McGill University (seven per cent), Université Laval (seven per cent) and other universities (three per cent). Most respondents practise in Montreal (46 per

cent), with the remaining 54 per cent distributed all over the province.

Weekly schedules vary in the following manner: 25 per cent work less than 20 hours a week, 53 per cent work between 31 and 40 hours and 22 per cent work more than 40 hours. Almost half of the respondents are in solo practice, 21 per cent work with an associate and nine per cent work with more than one associate. Thirteen per cent work on percentage or on salary as dentists, civil servants, university professors or hospital dentists, or are retired.

Most of the respondents work with a full-time assistant (64 per cent) and have a receptionist (59 per cent). Thirty-six per cent employ a dental hygienist, or a technician (six per cent). Almost half of the respondents are less than 35 years of age. The majority are married (74 per cent) or live with someone (five per cent). Fourteen per cent are single, two per cent separated, five per cent divorced and one per cent widowed.

Results — Discussion

The situations presented in the survey obtaining mean scores higher than 3.0 were considered as stressful to very stressful. Ten of these situations were identified (**Table I**). Situations viewed as slightly or not at all stressful obtained mean scores less than 2.0. Three of these

low-stress situations were identified. Finally, situations viewed as just stressful obtained mean scores from 2.0 to 3.0. This was the case for the majority of the situations.

The situation that seems to cause the most stress is patient dissatisfaction with the care received (mean = 3.66), followed by providing care to an uncooperative patient (mean = 3.46). These results can be compared to those of Cecchini,²⁰ who found that the most stressful situation was "working with an angry patient." This author's questionnaire was not as specific as the one used in the current study when it came to describing situations, although these remain related to the interpersonal relations sphere.

Most of the 10 situations identified as being stressful concern task-related stress or stress involving practice management and office organization. From a task perspective, stressful situations include: proceeding to a difficult and unexpected operation (mean = 3.27) and treatment of a complex case with an unfavorable prognosis (mean = 3.23). Receiving little job satisfaction also received a high score (mean = 3.23).

Practice management difficulties were also noted in previous studies.^{20,21} The first stressful situation in this category relates to time management, where falling behind schedule is seen to be very stressful (mean = 3.41). These results are similar to those of Howard et al²¹ and Cecchini,²⁰ who identified time concerns as a major cause of stress.

The next most-cited stressful situation is the dentist's financial burden (mean = 3.25). The importance of this situation as a source of stress is also noted by Forrest¹⁰ and Morse.²² In our survey, it is followed closely by gaining and maintaining good control over office management (mean = 3.05), which is also noted by Morse.

Like Cecchini,²⁰ we found that dentists rank overwork among the most stressful situations (mean = 3.01). This evaluation also supports Forrest's results,¹⁰ which showed that dentists tend to overbook the appointment schedule.

After our survey results were re-

TORADOL®

10 mg tablets & 30 mg/mL IM injections KETOROLAC TROMETHAMINE

Effectively treating acute pain

TORADOL® (ketorolac tromethamine) 10 mg tablets

TORADOL® IM (ketorolac tromethamine injection) 10 mg/mL, 15 mg/mL or 30 mg/mL intramuscular injection

THERAPEUTIC CLASSIFICATION: Analgesic Agent

ACTION:

Toradol (ketorolac tromethamine) is a non-steroidal anti-inflammatory drug (NSAID) that exhibits analgesic activity mediated by peripheral effects. Ketorolac inhibits the synthesis of prostaglandins through inhibition of the cyclo-oxygenase enzyme system. At analgesic doses, it has minimal anti-inflammatory and antipyretic activity. Pain relief is comparable following the administration of ketorolac by intramuscular or oral routes. The peak analgesic effect occurs at 2-3 hours post-dosing with no evidence of a statistically significant difference over the recommended dosage range. The greatest difference between large and small doses of Toradol administered by either route is in the duration of analgesia. Ketorolac tromethamine is rapidly and completely absorbed when administered by either the oral or the intramuscular route. The pharmacokinetics are linear following single and multiple dosing. Steady state plasma levels are attained after one day of Q.I.D. dosing. Following oral administration, peak plasma concentrations of 0.7 to 1.1 µg/mL occurred at an average of 44 minutes after a single 10 mg dose. The terminal plasma elimination half-life ranged between 2.4 and 9.0 hours in healthy adults, while in elderly subjects (mean age = 72 years), it ranged between 4.3 and 7.6 hours. A high fat meal decreased the rate, but not the extent, of absorption of oral ketorolac tromethamine.

The use of an antacid had no effect on the pharmacokinetics of ketorolac. Following intramuscular administration, peak plasma concentrations of 2.2 to 3.0 µg/mL occurred an average of 50 minutes after a single 30 mg dose. The terminal plasma half-life ranged between 3.5 and 9.2 hours in young adults and between 4.7 and 8.6 hours in elderly subjects (mean age = 72 years). In renally impaired patients there is a reduction in clearance and an increase in the terminal half-life of ketorolac tromethamine (see table below). The primary route of excretion of ketorolac tromethamine and its metabolites (conjugates and the p-hydroxy metabolite) is in the urine (91.4%) with the remainder (6.1%) being excreted in the feces. More than 99% of the ketorolac in plasma is protein bound over a wide concentration range. The hemodynamics of anaesthetized patients were not altered by parenteral administration of Toradol.

THE INFLUENCE OF AGE, LIVER AND KIDNEY FUNCTION ON THE CLEARANCE AND TERMINAL HALF-LIFE OF TORADOL IM¹ AND ORAL²

TYPES OF SUBJECTS	TOTAL CLEARANCE (in L/h/kg) ³		TERMINAL HALF-LIFE (in hours)	
	IM MEAN (range)	ORAL MEAN (range)	IM MEAN (range)	ORAL MEAN (range)
Normal Subjects IM (n=54) Oral (n=77)	0.023 (0.010-0.046)	0.025 (0.013-0.050)	5.3 (3.5-9.2)	5.3 (2.4-9.0)
Healthy Elderly Subjects (n=13), Oral (n=12) (mean age = 72, range = 65-78)	0.019 (0.013-0.034)	0.024 (0.018-0.034)	7.0 (4.7-8.6)	6.1 (4.3-7.6)
Patients with Hepatic Dysfunction IM and Oral (n=7)	0.029 (0.013-0.066)	0.033 (0.019-0.051)	5.4 (2.2-6.9)	4.5 (1.6-7.6)
Patients with Renal Impairment IM and Oral (n=9) (serum creatinine 1.9-5.0 mg/dL)	0.014 (0.007-0.043)	0.016 (0.007-0.052)	10.3 (8.1-15.7)	10.8 (3.4-18.9)
Renal Dialysis Patients IM (n=9)	0.016 (0.003-0.036)		13.6 (8.0-39.1)	

¹ Estimated from 30 mg single IM doses of ketorolac tromethamine

² Estimated from 10 mg single oral doses of ketorolac tromethamine

³ Litres/hour/kg/gram

INDICATIONS:

Oral Route: Orally administered Toradol (ketorolac tromethamine) is indicated for the short-term management of mild to moderately severe pain, including post-surgical pain (such as general, orthopaedic and dental surgery), acute musculoskeletal trauma pain and post-partum uterine cramping pain.

Intramuscular Route: Intramuscular injection of Toradol is indicated for the short-term management of moderate to severe pain, including pain following major abdominal, orthopaedic and gynecological operative procedures.

CONTRAINDICATIONS:

Hypersensitivity: Like other non-steroidal anti-inflammatory drugs, Toradol (ketorolac tromethamine) has been associated with hypersensitivity reactions. Toradol should not be used when there is a known or suspected hypersensitivity to the drug. Because of the possibility of cross-sensitivity, Toradol should not be used in patients with the complete or partial syndrome of nasal polyps, angioedema, bronchospastic reactivity (e.g. asthma) or other allergic manifestations to acetylsalicylic acid (ASA) or other non-steroidal anti-inflammatory drugs. Severe and fatal anaphylactoid reactions have occurred in such individuals.

Gastrointestinal: As with other NSAIDs, Toradol also should not be used in patients with peptic ulcer or active inflammatory disease of the gastrointestinal system. Severe and fatal reactions have occurred in such individuals.

WARNINGS:

The long-term administration of Toradol (ketorolac tromethamine) is not recommended. The most serious risks associated with NSAIDs including Toradol are:

Gastrointestinal Ulcerations, Bleeding and Perforation: Serious gastrointestinal toxicity, such as bleeding, ulceration, and perforation, can occur at any time, with or without warning symptoms, during therapy with non-steroidal anti-inflammatory drugs. To date, studies with NSAIDs have not identified any subset of patients not at risk for developing peptic ulceration and bleeding. Post-marketing experience with Toradol suggests that there may be a greater risk of gastrointestinal ulcerations, bleeding, and perforation in the elderly, and most spontaneous reports of fatal gastrointestinal events are in the aged population.

LONG-TERM USE OF TORADOL: The oral use of Toradol 10 mg QID on a long-term basis is associated with more gastrointestinal tract adverse effects than is ASA 650 mg QID.

In a clinical trial in 823 patients with chronic pain states comparing Toradol tablets 10 mg QID (553 patients) with ASA 650 mg QID (270 patients), during the first week there was a 2.4% dropout rate because of upper GI complaints in the Toradol tablets treated patients compared with 0.4% rate in the ASA treated group. After the first 2 weeks, the dropout rate due to GI pain or discomfort were comparable in both treatment groups. The time-adjusted percentages, which are not statistically significantly different, of patients who developed ulcer or upper GI bleeding are as follows:

	CUMULATIVE OCCURRENCE KETOROLAC	ASA
INTERVAL		
≤ 3 months	0.69*	0*
≤ 6 months	1.59*	0.73*

*There was no statistically significant difference between ketorolac and ASA at either of the intervals tested.

PHYSICIANS SHOULD CAREFULLY WEIGH THE POTENTIAL RISKS AND BENEFITS OF USING TORADOL TABLETS ON A LONG-TERM BASIS. PATIENTS SHOULD BE INSTRUCTED TO WATCH FOR SIGNS OF SERIOUS GI ADVERSE EVENTS AND THEY SHOULD BE MONITORED MORE CLOSELY THAN IF THEY WERE ON ANOTHER NSAID.

Renal Toxicity: The following renal abnormalities have been associated with Toradol and other drugs that inhibit renal prostaglandin biosynthesis: acute renal failure, nephrotic syndrome, interstitial nephritis, renal papillary necrosis.

Haemorrhage: Postoperative haematomas and other symptoms of wound bleeding have been reported in association with the perioperative use of intramuscular Toradol. If Toradol is to be administered to patients who have coagulation disorders or who are receiving drug therapy that interferes with haemostasis, careful observation is advised.

Hypersensitivity Reactions: The possibility of severe or fatal hypersensitivity reactions should be considered, even for patients with no known history of previous exposure or hypersensitivity to Toradol or other NSAIDs. As with other NSAIDs, patients should be questioned for history of allergy to NSAIDs or ASA or for the syndrome consisting of nasal polyps, ASA allergy and asthma before being prescribed Toradol. Asthmatic patients with triad asthma (the syndrome of nasal polyps, asthma and hypersensitivity to ASA or other NSAIDs) may be at particular risk for severe hypersensitivity reactions.

Other NSAIDs: Ketorolac tromethamine is not recommended for concurrent use with other NSAIDs because of the potential for additive side effects.

Use in Pregnancy and Lactation: The administration of ketorolac tromethamine is not recommended during pregnancy or lactation. After 1 day at 10 mg QID, oral dosing, Toradol has been detected in the milk of lactating women at a maximum concentration of 7.9 ng/mL.

Use in Labour: Ketorolac tromethamine is not recommended for use as an obstetric preoperative medication or for obstetrical analgesia because of the known effects of NSAIDs on uterine contraction and fetal circulation.

Use in Children: Safety and efficacy in children have not been established. Therefore Toradol is not recommended for use in children under age 16.

Use in the Elderly: Because ketorolac is cleared somewhat more slowly by the elderly (See PHARMACOKINETICS) who are also more sensitive to the gastrointestinal and renal effects of NSAIDs (See WARNINGS and PRECAUTIONS), extra caution and the lowest effective dose (See DOSAGE AND ADMINISTRATION) should be used.

PRECAUTIONS:

Physicians should be alert to the pharmacologic similarity of Toradol (ketorolac tromethamine) to other non-steroidal anti-inflammatory drugs that inhibit cyclo-oxygenase. Toradol is not an anesthetic agent and possesses no sedative or anxiolytic properties.

Gastrointestinal Effects: Close medical supervision is recommended in patients prone to gastrointestinal tract irritation, particularly those with a history of peptic ulcer, diverticulosis or other inflammatory disease of the gastrointestinal tract. In these cases, the physician must weigh the benefits of treatment against the possible hazards. Patients taking an NSAID including ketorolac tromethamine should be instructed to contact a physician immediately if they experience symptoms or signs suggestive of peptic ulceration or gastrointestinal bleeding. These reactions can occur at any time during the treatment. If peptic ulceration is suspected or confirmed, or if gastrointestinal bleeding occurs, ketorolac tromethamine should be discontinued and appropriate treatment instituted with close patient monitoring.

Renal Effects: As with other drugs that inhibit prostaglandin biosynthesis, elevation of blood urea nitrogen (BUN) and creatinine have been reported in clinical trials with (ketorolac tromethamine). Since ketorolac tromethamine and its metabolites are excreted primarily by the kidney, the following precautions are indicated for patients with: **Severely impaired renal function** (serum creatinine values greater than 5 mg/dL, 442 µmol/L): Toradol is not recommended; **Moderately impaired renal function** (serum creatinine values ranging from 1.9-5.0 mg/dL, 168 to 442 µmol/L) - The total daily dose of ketorolac tromethamine should be reduced by half. In these patients the rate of ketorolac tromethamine clearance was reduced to approximately half of normal. Patients who are volume depleted may be dependent on renal prostaglandin production to maintain renal perfusion and, therefore, glomerular filtration rate. In such patients, the use of drugs which inhibit prostaglandin synthesis has been associated with further decreases in renal blood flow. Predisposing factors include sepsis, impaired renal function, heart failure, liver dysfunction, diuretic therapy, and advanced age. Caution advised if ketorolac tromethamine is used in such circumstances. Close monitoring of urine output, serum urea and serum creatinine is recommended until renal function recovers.

Hepatic Effects: Meaningful elevations (greater than 3 times normal) of serum transaminases (glutamate pyruvate (SGPT or ALT) and glutamic oxalacetic (SGOT or AST)), occurred in controlled clinical trials in less than 1% of patients. If clinical signs and symptoms consistent with liver disease develop, or if systemic manifestations occur (e.g., eosinophilia, rash, etc.), ketorolac tromethamine should be discontinued. Patients with impaired hepatic function from cirrhosis do not have any clinically important changes in ketorolac tromethamine clearance. Studies in patients with active hepatitis or cholestasis have not been performed.

Fluid and Electrolyte Balance: Fluid retention and edema have been observed in patients treated with Toradol. Therefore, as with many other NSAIDs, the possibility of precipitating congestive heart failure in elderly patients or those with compromised cardiac function should be considered. Toradol should be used with caution in patients with cardiac decompensation, hypertension or other conditions which cause a predisposition to fluid retention.

Hematologic Effects: Ketorolac tromethamine inhibits platelet function and may prolong bleeding time. It does not affect platelet count, prothrombin time (PT) or partial thromboplastin time (PTT). Unlike the prolonged effects from ASA the inhibition of platelet function by ketorolac tromethamine is normalized within 24 to 48 hours after the drug is discontinued. Patients on full anti-coagulation therapy (e.g. heparin or dicumarol derivatives) may be at increased risk of bleeding if given Toradol concurrently. Thus, the benefit should be weighed against this risk. The concomitant use of Toradol and heparin (5000 U s.c. BID) appears to be associated with less risk (see DRUG INTERACTIONS). In patients receiving anticoagulants, the use of intramuscular haematoma formation from Toradol IM injections may be increased. In post-marketing experience, postoperative wound haemorrhage has been reported with the use of Toradol. Therefore, caution should be exercised when strict haemostasis is critical. Toradol IM

not recommended as a pre-operative or intra-operative medication because of the risk of excessive bleeding. Blood dyscrasias associated with the use of NSAIDs are rare, but could occur with severe consequences.

Infection: In common with other non-steroidal anti-inflammatory drugs, ketorolac tromethamine may mask the usual signs of infection.

DRUG INTERACTIONS:

Protein Binding: Toradol (ketorolac tromethamine) is highly bound to human plasma protein (mean 99.2%) and binding is independent of concentration. As ketorolac tromethamine is a highly potent drug and present in low concentrations in plasma, it would not be expected to displace other protein-bound drugs significantly. Therapeutic concentrations of digoxin, warfarin, acetaminophen, phenytoin, and tolbutamide did not alter ketorolac tromethamine protein binding.

Anticoagulant Therapy: Prothrombin time should be carefully monitored in all patients receiving oral anticoagulant therapy concomitantly with ketorolac tromethamine. Toradol IM given with two doses of 5000 U of heparin to 11 healthy volunteers resulted in a mean template bleeding time of 6.4 min (3.2-11.4 min) compared to a mean of 6.0 min (3.4-7.5 min) for heparin alone and 5.1 min (3.5-8.5 min) for placebo. The *in vitro* binding of warfarin to plasma proteins is only slightly reduced by ketorolac tromethamine (99.5% control vs. 99.3%) at plasma concentrations of 5 to 10 µg/mL.

Digoxin: Ketorolac tromethamine does not alter digoxin protein binding.

Salicylates: *In vitro* studies indicated that, at therapeutic concentrations of salicylates (300 µg/mL), the binding of ketorolac tromethamine was reduced from approximately 99.2% to 97.5% representing a potential two-fold increase in unbound Toradol plasma levels.

Enzyme Induction: There is no evidence, in animal or human studies, that ketorolac tromethamine induces or inhibits the hepatic enzymes capable of metabolizing itself or other drugs. Hence, it would not be expected to alter the pharmacokinetics of other drugs due to enzyme induction or inhibition mechanisms.

Trobenecid: Concomitant administration of ketorolac tromethamine and trobenecid results in the decreased clearance of ketorolac and a significant increase in ketorolac plasma levels (approximately three-fold increase) and terminal half-life (approximately two-fold increase).

Furosemide: Ketorolac tromethamine reduces the diuretic response to furosemide by approximately 20% in normovolemic subjects.

Lithium: Some NSAIDs have been reported to inhibit renal lithium clearance, leading to an increase in plasma lithium concentrations and potential lithium toxicity. The effect of ketorolac tromethamine on lithium plasma levels has not been studied.

Methotrexate: The concomitant administration of methotrexate and some NSAIDs has been reported to reduce the clearance of methotrexate, thus enhancing its toxicity. The effect of ketorolac tromethamine on methotrexate clearance has not been studied.

Morphine: Intramuscular Toradol has been administered concurrently with morphine in several clinical trials of postoperative pain without evidence of adverse interactions.

ADVERSE EVENTS:

TORADOL TABLETS: Short-Term Patient Studies - The incidence of adverse reactions in 371 patients receiving multiple 10 mg doses of Toradol (ketorolac tromethamine) for pain resulting from surgery or dental extraction during the post-operative period (less than 2 weeks) is listed below. These reactions may or may not be drug related. **Incidence between 4 and 9%:** **Nervous system** - somnolence, insomnia; **Digestive system** - nausea. **Incidence between 2 and 3%:** **Nervous system** - nervousness, headache, dizziness; **Digestive system** - diarrhea, dyspepsia, gastrointestinal pain, constipation. **Body as a whole** - fever. **Incidence 1% or Less:** **Nervous system** - abnormal dreams, anxiety, dry mouth, hyperkinesia, paresthesia, increased sweating, euphoria, hallucinations; **Digestive system** - anorexia, flatulence, vomiting, stomatitis, gastritis, gastrointestinal disorder, sore throat; **Body as a whole** - asthenia, pain, back pain; **Cardiovascular system:** vasodilatation, palpitation, migraine, hypertension; **Respiratory system** - cough increased, rhinitis, dry nose; **Musculo-skeletal system** - myalgia, arthralgia; **Skin and appendages** - rash, urticaria; **Special senses** - blurred vision, ear pain; **Urogenital system:** dysuria.

Long-Term Patient Study - The adverse reactions listed below were reported to be probably related to study drug in 553 patients receiving long-term oral therapy (approximately 1 year) with Toradol. **Incidence between 10 and 12%:** **Digestive system** - dyspepsia, gastrointestinal pain.

Incidence Between 4 and 9%: **Digestive system** - nausea, constipation; **Nervous system** - headache. **Incidence Between 2 and 3%:** **Digestive system** - diarrhea, flatulence, gastrointestinal fullness, peptic ulcers; **Nervous system** - Dizziness, somnolence; **Metabolic/Nutritional disorder** - edema. **Incidence 1% or Less:** **Digestive system** - eructation, stomatitis, vomiting, anorexia, duodenal ulcer, gastritis, gastrointestinal hemorrhage, increased appetite, melena, mouth ulceration, rectal bleeding, sore mouth; **Nervous system** - abnormal dreams, anxiety, depression, dry mouth, insomnia, nervousness, paresthesia; **Special senses** - tinnitus, taste perversion, abnormal vision, blurred vision, deafness, locomotion disorder; **Metabolic/Nutritional disorder** - Weight gain, alkaline phosphatase increase, BUN increased, excessive thirst, generalized edema, hyperuricemia; **Skin and appendages** - pruritus, rash, burning sensation skin; **Body as a whole** - asthenia, pain, back pain, face edema, hemic; **Musculo-skeletal system** - arthralgia, myalgia, joint disorder; **Cardiovascular system:** chest pain, chest pain substernal, migraine; **Respiratory system** - dyspnea, asthma, epistaxis; **Urogenital system** - hematuria, increased urinary frequency, oliguria, polyuria; **Hemic and lymphatic** - Anemia, purpura.

TORADOL IM: The adverse reactions listed below were reported in Toradol IM clinical efficacy trials. In these trials patients (n=660) received either single 30 mg doses (n=151) or multiple 10 mg doses (n=509) over a time period of 5 days or less for pain resulting from surgery.

These reactions may or may not be drug related. **Incidence Between 10 and 13%:** **Nervous system** - somnolence; **Digestive system** - Nausea. **Incidence Between 4 and 9%:** **Nervous system** - headache; **Digestive system** - vomiting; **Injection site** - injection site pain. **Incidence between 2 and 3%:** **Nervous System** - sweating, dizziness; **Cardiovascular system** - vasodilatation. **Incidence 1% or Less:** **Nervous system** - insomnia, increased dry mouth, abnormal dreams, anxiety, depression, paresthesia, nervousness, paranoid reaction, speech disorder, euphoria, libido increased, excessive thirst, inability to concentrate, stimulation; **Digestive system** - flatulence, anorexia, constipation, diarrhea, dyspepsia, gastrointestinal fullness, gastrointestinal hemorrhage, gastrointestinal pain, melena, sore throat, liver function abnormalities, rectal bleeding, stomatitis; **Cardiovascular system** - hypertension, chest pain, tachycardia, hemorrhage, palpitation, pulmonary embolus, syncope, ventricular tachycardia, pallor, flushing; **Injection site** - injection site reaction; **Body as a whole** - asthenia, fever, back pain, chills, pain, neck pain; **Special senses** - taste perversion, tinnitus, blurred vision, diplopia, retinal hemorrhage; **Musculo-skeletal system** - myalgia, twitching; **Respiratory system** - asthma, cough increased, dyspnea, epistaxis, hiccup, rhinitis; **Skin and appendages** - pruritus, rash, subcutaneous hematoma, skin disorder; **Urogenital system** - dysuria, urinary retention, oliguria, increased urinary frequency, vaginitis; **Metabolic/nutritional disorders** - edema, hypokalemia, hypovolemia **Hemic and lymphatic system** - anemia, coagulation disorder, purpura.

Post-Marketing Experience: The following post-marketing adverse experiences, although rare (1% or less), have been reported for patients who have received either formulation of Toradol.

Renal events - acute renal failure, flank pain with or without haematuria and/or azotemia; **Hypersensitivity reactions:** bronchospasm, laryngeal edema, hypotension, flushing, rash, and anaphylactoid reactions, such reactions have occurred in patients with no prior history of hypersensitivity. **Gastrointestinal events** - gastrointestinal hemorrhage, peptic ulceration, gastrointestinal perforation; **Hematologic events** - postoperative wound haemorrhage, rarely requiring blood transfusion (see PRECAUTIONS), thrombocytopenia; **Central nervous system:** convulsions, abnormal dreams, hallucinations, hyperkinesia, hearing loss; **Cardiovascular:** pulmonary edema; **Dermatology** - Lyell's syndrome, Stevens - Johnson syndrome, exfoliative dermatitis, maculopapular rash.

OVERDOSAGE: The absence of experience with acute overdosage precludes characterization of sequelae and assessment of antidotal efficacy at this time. In a gastroscopic study of healthy subjects, daily doses of 360 mg given over an 8-hour interval for each of five consecutive days (3 times the highest recommended dose) caused pain and peptic ulcers which resolved after discontinuation of dosing.

DOSEAGE AND ADMINISTRATION:

Adults: Dosage should be adjusted according to the severity of the pain and the response of the patient. **Oral:** The usual oral dose of Toradol (ketorolac tromethamine) is 10 mg every 4 to 6 hours for pain as required. Doses exceeding 40 mg per day are not recommended. Toradol is recommended for short-term use only, i.e., for a maximum of a few weeks.

Parenteral: The recommended usual initial dose is 30 mg. Subsequent dosing may be 10 mg to 30 mg every 4-6 hours as needed to control pain. It is recommended that the administration of Toradol IM be limited to short-term therapy (not over 5 days) and the total daily dose should not exceed 120 mg.

This is because the risk of toxicity appears to increase with longer use at recommended doses (see WARNINGS and PRECAUTIONS). The administration of continuous multiple daily doses of Toradol IM has not been extensively studied. There has been limited experience with intramuscular dosing for more than 3 days since the vast majority of patients have transferred to oral medication or no longer required analgesic therapy after this time. In the initial post-operative period, more frequent dosing (e.g. every 2 hours) may be employed but the total daily dosing should not exceed 120 mg/day. If supplementary analgesia is required, a concomitant low dose of opiate can be used.

Patients under 50 kg, over age 65 years, or with less severe pain at baseline: the lower end of the dosage range (10-15 mg 4 times a day) is recommended.

Impaired Renal Function - Moderate - In patients with impaired renal function (serum creatinine values ranging from 1.9 to 5.0 mg/dL or 168 to 442 µmol/L), the total daily dose of Toradol should be reduced by half;

Severe - In patients with severely impaired renal function (serum creatinine values greater than 5 mg/dL or 442 µmol/L) Toradol is not recommended.

Conversion from Parenteral to Oral Therapy: Toradol tablets may be used either as monotherapy or as follow-on therapy to parenteral ketorolac. Toradol IM should be replaced by an oral analgesic as soon as feasible. When Toradol tablets are used as a follow-on therapy to parenteral ketorolac, the total combined daily dose of ketorolac (oral + parenteral) should not exceed 120 mg on the day the change of formulation is made. Subsequent oral dosing should not exceed the recommended daily maximum of 40 mg.

Directions for Use of the Prefilled Syringes: Insert the plunger into the syringe barrel and thread it onto the screw. WITHOUT REMOVING THE NEEDLE GUARD, apply quick, firm pressure to the plunger to break the inner seal. (You will feel it let go). Pull back on the plunger slightly to relieve pressure. Remove the needle guard by twisting as you pull. Use the unit as you would a normal syringe. Dispose of properly. Single use only. Discard Unused Portions. Parenteral drug products should be inspected visually for particulate material and discoloration prior to use. Toradol (ketorolac tromethamine) is a Schedule F drug.

Stability and Storage Recommendations:

Toradol Tablets: Store at room temperature with protection from light.

Toradol IM: Store at room temperature with protection from light.

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corded, we conducted a principal components analysis to discern aspects or dimensions of dental practice in which stressful situations are observed. This analysis shows that 30 per cent of the variability in survey responses was related to two specific dimensions of the practice. Seventeen per cent of this variability came from differences in the perception of stress due to task or organization (control by the practitioner of office management, influence of routine, etc.) (Table II). Thirteen per cent related to stress from interpersonal relations: patients needing special attention, effects of patients' fears, intricate cases, etc. (Table III). No other group of situations, according to the dimensions of work, explains the variability of the responses.

The remaining variability might be explained by the individual respondents' personality differences. In fact, the incidence of stressful events differs according to personality type. Friedman and Rosenmen²³ identified two models of behavior, types A and B, which are defined by the way individuals in each model approach stress. Type A behavior is defined by these characteristics: extreme need to act, spirit of competition, need to succeed, chronic feeling of being rushed. It implicates a more intense perception of stress than type B behavior, which is identified by the relative absence of these characteristics.

These personality outlines, which can affect results, are not controlled systematically in the present study. However, this study underlines the importance of the dentist's personality as a factor in the way he or she reacts to the stressful situations inherent to dental practice. This observation should encourage us to investigate this dimension further.

Importance of Sociological Variables

A Kruskal-Wallis test analysis of the sociological data provided by survey respondents, such as age, civil status, region of practice, etc., allowed us to isolate two variables that have a marked influence on the levels of stress. These variables

are age and, by extension, clinical experience, and type of practice.

The dentist's age is related to longer clinical experience and to a lower perception of stress. Therefore, the level of stress encountered is often lower for practitioners 55 years of age or more, and higher for those of less than 25 years of age.

Six of the 10 most stressful situations in dental practice are significantly correlated with age:

- 1) giving care to an uncooperative patient;
- 2) being behind schedule;
- 3) assuming a heavy financial burden;
- 4) giving care to very anxious patients;
- 5) working alone, without an assistant; and
- 6) difficulties in obtaining good control of office management.

In this study, we noted that stress resulting from office management remains high, despite the dentist's practice experience. The major effect of experience is on time management. It is much more stressful for the young dentist to be "behind schedule." These results confirm those of Cecchini.²⁰ A second important situation, which includes this variable, establishes that working alone, without an assistant, is less stressful for the older practitioner.

Eight situations are significantly correlated with the type of practice:

- 1) giving care to an uncooperative patient;
- 2) being behind schedule;
- 3) assuming a heavy financial burden;
- 4) giving care to very anxious patients;
- 5) the patient shows dissatisfaction toward the care he or she has received;
- 6) working alone, without an assistant;
- 7) difficulty obtaining good control of office management; and
- 8) treating a complex case with unfavorable prognosis.

It appears that practitioners who work for a salary or as professors, administrators or civil servants, as well as retired practitioners, have a tendency to evaluate these situations as less stressful. On the other hand, dentists working on percentage or those who have two or more

associates have a tendency to give them higher stress scores. Finally, respondents who do not employ a receptionist (those who have a more modest practice) ascribe a lower level of stress to the situation, "You have difficulties keeping control of the office," than those who employ one or more receptionists.

Conclusion

This study made it possible for us to discriminate, in the dental office practice context, specific situations that promote stress for most dentists. The precise identification of these situations allowed us to circumscribe stress by making it lose its vague and insidious character. Furthermore, knowledge of the main situations that generate stress makes the planning of preventive strategies possible.

Several measures have already been proposed,²⁴ including changes in both task and office management. These include adopting a more dynamic work system and adequate posture, knowing how to fight monotony, breaking routine by adopting new techniques, being up-to-date on recent scientific research and being able to reduce the number of practice hours. When it comes to interpersonal relations, the dentist must know how to help the patient to control his or her anxiety. The dentist must also know his or her limits of responsibility toward the patient, because, in the final analysis, the success or failure of treatment is the patient's responsibility. Finally, communications training promotes the establishment of a trusting relationship with patients and personnel.

One of the objects of this research is to update our knowledge of situations that cause stress in the dentist's practice. An analysis of our results showed the multifactorial dimension of the phenomenon. In other words, we cannot explain the variability of responses by a precise phenomenon, but only by a group of stressful factors. The study allowed the isolation of two explanatory possibilities: the perception of stress as related to working conditions, and the perception of stress as related to interpersonal relations problems.

The theories of Lazarus and Folkman²⁵ and the Michigan school were of great help in the interpretation of the results. Indeed, the situations presented as stress factors are not stressful, per se, as described by the variance of results. Stress is a subjective response induced not only by a specific situation, but modulated by other factors concerning lifestyle, demographic variables, psychological factors and traits of character.

The results are consistent with the paradigm, since 70 per cent of the variance is connected to the character traits of dentists, and this factor was not measured in the present study. Further research is needed to determine the magnitude of this variable.

In a context of prevention, it would be important to put emphasis on further research directed towards a better preparation of dental students to help them cope with stress situations in their profession. ■

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January/
Janvier
1994
Vol. 60
No. 1

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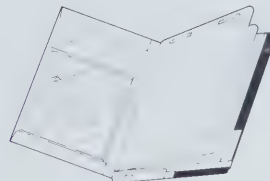
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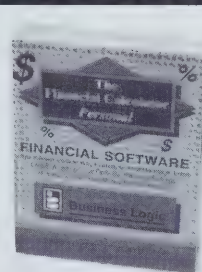
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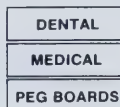
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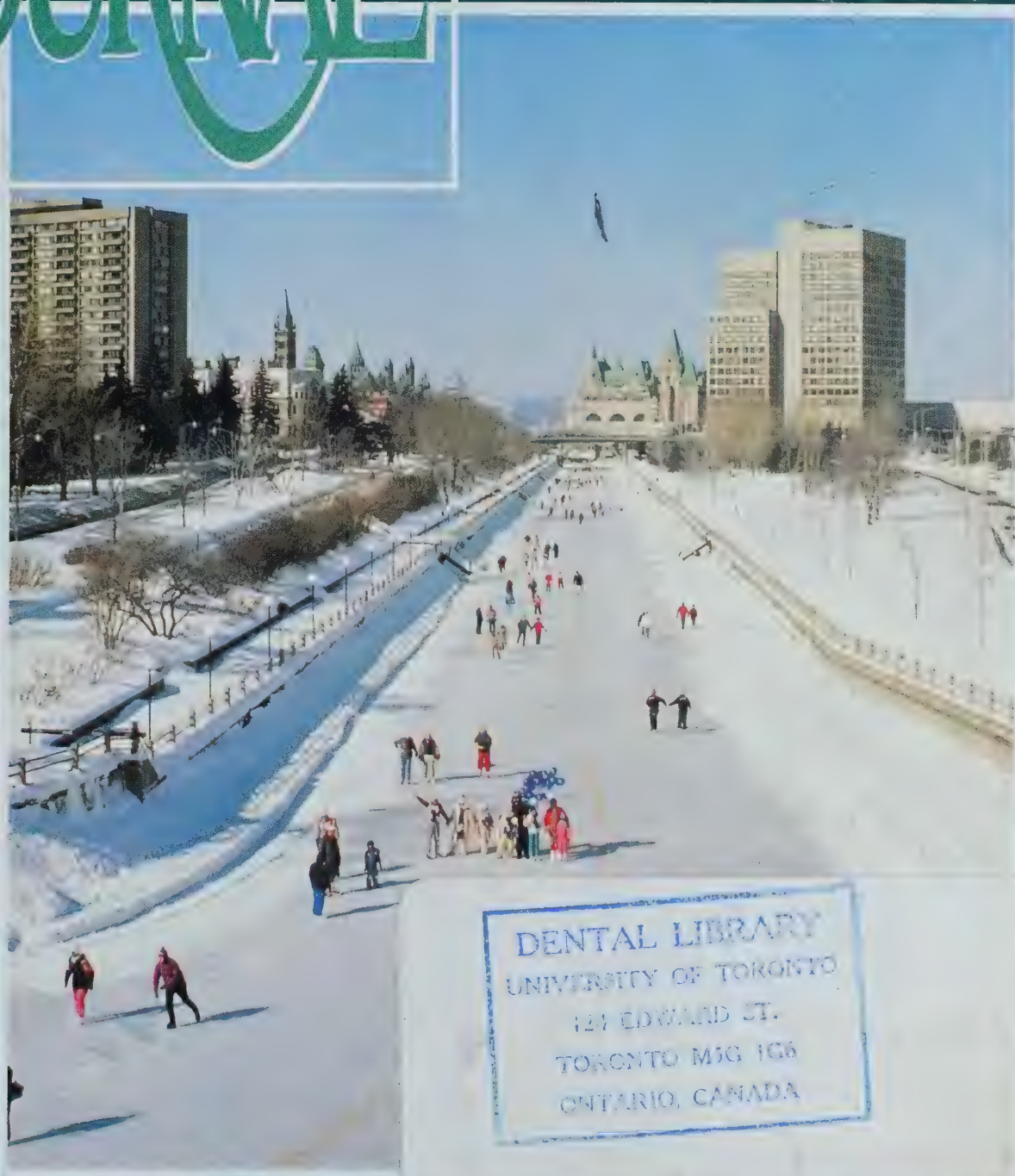
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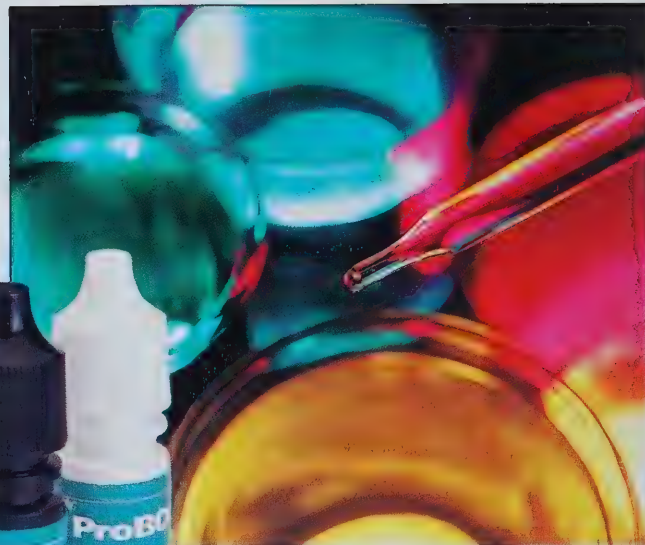
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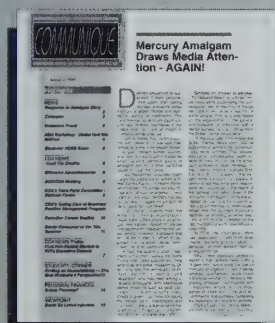
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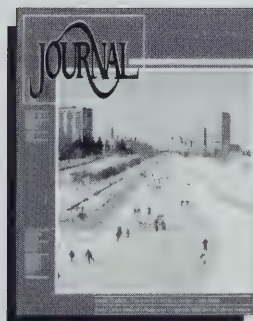
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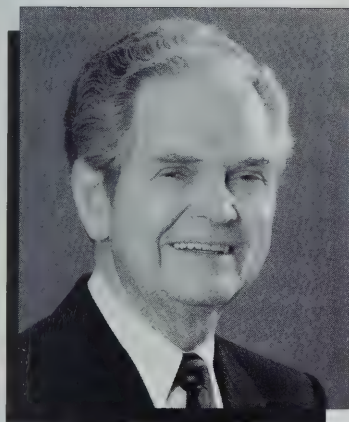
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EDITORIAL

FEATHERS IN THE WIND



Dr. P. Ralph Crawford,
Editor

Many, many years ago, at my mother's knee, I heard a story about a village busybody who made a habit of telling false stories about his neighbors. Much of this villager's activity was harmless, or so my mother said, but unfortunately some of his tall tales did affect the lives of the innocent.

When caught in the act, the story teller's usual retort was, "I'm sorry, I didn't mean to hurt anyone." Perhaps he believed that a simple apology could somehow undo irreparable harm.

One day, the perpetrator, having gone a little too far with one of his fabrications, was hailed before the village magistrate. And again, the familiar refrain was heard in his defense, "I'm sorry, I didn't mean to hurt anyone."

The learned magistrate delivered justice with wisdom, instructing the story teller to remain at home until the first windy day, at which time he was to return to the court with a feather pillow.

Duty-bound, on the first windy day the village story teller returned to court, pillow in hand. The magistrate then commanded him to carry the pillow to the nearest hill, where he was to tear it open, releasing its feathers to fly where they may. Af-

terwards, the story teller was to return to the court.

When the story teller had completed his assignment and again stood before the court, clasping the empty pillow case to his breast, the magistrate said sternly, "Now, you are to go out into the countryside, find all of the feathers that escaped from your pillow, and replace them in the case." With a wail of anguish, the guilty one proclaimed, "But that's impossible."

"Exactly," said the wise magistrate. "And that is what happens when you spread unsubstantiated stories and falsehoods. They fly far and wide, and, once uttered, it's extremely difficult, if not impossible, to take them back. Simply saying 'I'm sorry' doesn't repair the damage."

As was the case with most of my Irish mother's stories, I was never sure if this one actually happened. But of this I am sure, her wisdom can easily be applied to an editor's desk. Written and spoken words are very effective but fragile entities. Used properly, their influence is inestimable, but if they are used carelessly, the results can be disastrous.

Producing the *Journal of the Canadian Dental Association* — now in its 60th year of publication — is no small task for a staff of five people. Consider the year just past. The 12 issues of the 1993 *Journal* contained a total of 1,024 pages. At an average of 750 words per page, that translates into over 750,000 words, each of which had to be checked and rechecked for relevance and accuracy. Last year, a total of 132 authors contributed to the 69 scientific papers and clinical features published in the *Journal*. And not every paper submitted to the *Journal* finds its way into the magazine. While every paper we receive is given due consideration, a third are rejected outright by our editorial consultants or myself. Unfortunately, a few of these rejects occasionally turn up in publications with less rigid peer review standards than ours.

In addition to the full-length clinical and research papers we receive each month, hundreds and hundreds of news stories, letters to the

editor, obituaries, opinion pieces and book reviews must also be considered for their value to the *Journal's* more than 18,000 readers. This is a heavy responsibility, given that most of the information we publish on a regular, monthly, basis is not available in any other national dental publication.

But there is always room for more material in the *Journal*, especially clinical articles and actual case reports. We realize that many dentists are not accustomed to publishing, but we sincerely encourage the amateur writer to contribute. If your material has merit, our expert "wordsmiths" are willing and able to work with you to ensure that it meets our standards. Submissions should be typewritten, double spaced and, where possible, submitted in both hard copy and on computer disk. However, even in this age of high tech, we still occasionally receive illegible epistles scribbled on the back of old envelopes or prescription pads.

During its 60th year of publication, the *Journal*, as the authoritative written voice of the Canadian Dental Association, will continue its six-decade-old responsibility to inform dentists about issues of significance to the profession. We consider ourselves honored by the task our members and readers have set before us.

We also consider ourselves fortunate that we seldom have to seek out and recapture aberrant words — like feathers in the wind — because our readers have consistently accepted the role of the wise and learned magistrate, keeping us aware of our duty and responsibility. Don't let us down.

P. Ralph Crawford, BA, DMD
Editor of the *Journal of the Canadian Dental Association*

*The Moving Finger writes;
and, having writ,
Moves on: nor all your Piety
nor Wit
Shall lure it back to cancel
half Line
Nor all your Tears wash out
a Word of it
— Omar Kayyam, Rybaiyat*

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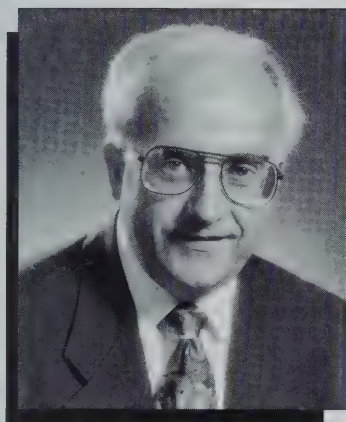
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IVOCLAR WILLIAMS

PRESIDENT'S COLUMN

ANOTHER LOOK AT INFECTION CONTROL



Dr. Raymond Wenn,
President of CDA

In the nearly four years since the Centers for Disease Control (CDC) in Atlanta announced that Kimberly Bergalis may have contracted HIV from her dentist, Dr. David Acer, dentistry has been turned upside down. Infection control has become the watchword for the '90s, and masks, gowns and gloves have joined the handpiece as an essential part of the dentist's armamentarium.

The so-called "Florida case" put dentistry into the media spotlight. And as the debate raged about whether infected health care providers should perform so-called "invasive procedures," or whether patients had the right to know their practitioner's HIV status, the infection control guidelines of dentistry's regulatory and authoritative bodies were subjected to intense scrutiny.

CDA published its first infection control guidelines in 1987, after carefully reviewing the available scientific literature and research. But in early 1991, as public concern over the risk of contracting HIV in the dental office continued to escalate, and CDC revealed that at least two more patients may have contracted HIV from Dr.

Acer, CDA began to re-examine those guidelines. That process culminated on April 14-15 in Ottawa, when the association hosted a special conference on "The Impact of HIV and Other Infectious Agents on Oral Health Care."

At the time, CDA and other dental organizations were under intense public pressure to make their infection control guidelines more stringent. Some did. But despite the public pressure, CDA chose to base its recommendations on science, not fear. The 1991 conference eventually reaffirmed the validity of CDA's existing guidelines, with a few minor revisions. These were presented to the profession in the form of a six-point plan, which, among other things, called for dentists to "inform the dental licensing authority when a serious injury, dependency, infection or any other condition has either immediately affected, or may affect overtime, his or her ability to practise safely and competently." In addition, licensing authorities and provincial associations were encouraged to "ensure that mechanisms are in place not only to protect the public, but to encourage their members to report, on a confidential basis, any such conditions by providing expert review panels to support, counsel and advise practitioners on the appropriate range of dental services to undertake, given the specific circumstances."

In short, Canadian dentistry refused to over react to media pressure and public hysteria, and Canadian dentists should be justifiably proud of CDA's accomplishments in the area of infection control. The fact that Canadian dentists have preserved their right of self regulation, without the rise of a Canadian equivalent to OSHA, speaks for itself.

Recently, however, the infection control question took a new twist. In 1992, D.L. Lewis and others published two articles on the potential for infection to be transmitted from patient to patient via the dental handpiece. These studies found that high-level disinfection may not prevent this transmission, and suggested that all dental handpieces must be heat sterilized between patients. Once again, dentistry was in the media spotlight and, once again, dentistry's authoritative and regulatory bodies were

urged to clamp down on infection control.

CDA's policy on the sterilization of handpieces is clear: "handpieces and similar intraoral devices should be sterilized according to the manufacturer's directions; if not sterilizable, they must receive appropriate high-level disinfection." We continue to believe that this policy fully protects the public from the risk of disease transmission within the dental office, and that it is scientifically sound. While the work of Lewis and others received extensive coverage in the media, the validity of this research has been put in question by the scientific community.

Certainly a new study by Joel Epstein et al. (Epstein, J.B., Rea, G., Sibau, L. et al. *Rotary Dental Instruments and the Potential Risk Of Transmission of Infection: Herpes Simplex Virus. JADA* 124(12):55-59, 1993.) seems to indicate that Lewis was premature in his conclusions with respect to the sterilization of handpieces. Epstein's results "suggest that it is possible to destroy the infectivity of these viruses (Herpes Simplex) on contaminated dental handpieces by appropriate disinfection of external and internal surfaces."

So where do we go from here. As a responsible organization, we must not rest on our laurels. We have a responsibility to both the public and the dental profession to ensure that our infection control guidelines are effective and safe. Perhaps it is time for CDA to consider convening a third symposium on the infection control issue, to review the accumulated data and determine if our recommendations are withstanding the test of time. In the interim, it is important for dentistry to continue the infection control debate, and for dentists to support or criticize our current positions through scientific journals and meetings.

But equally important, we must guard against those who would bury us in unnecessary infection control minutia, which do nothing to protect the public or dental practitioners, and only drive the cost of dental services sky-high.

*Raymond Wenn, DDS
President of the Canadian Dental Association*

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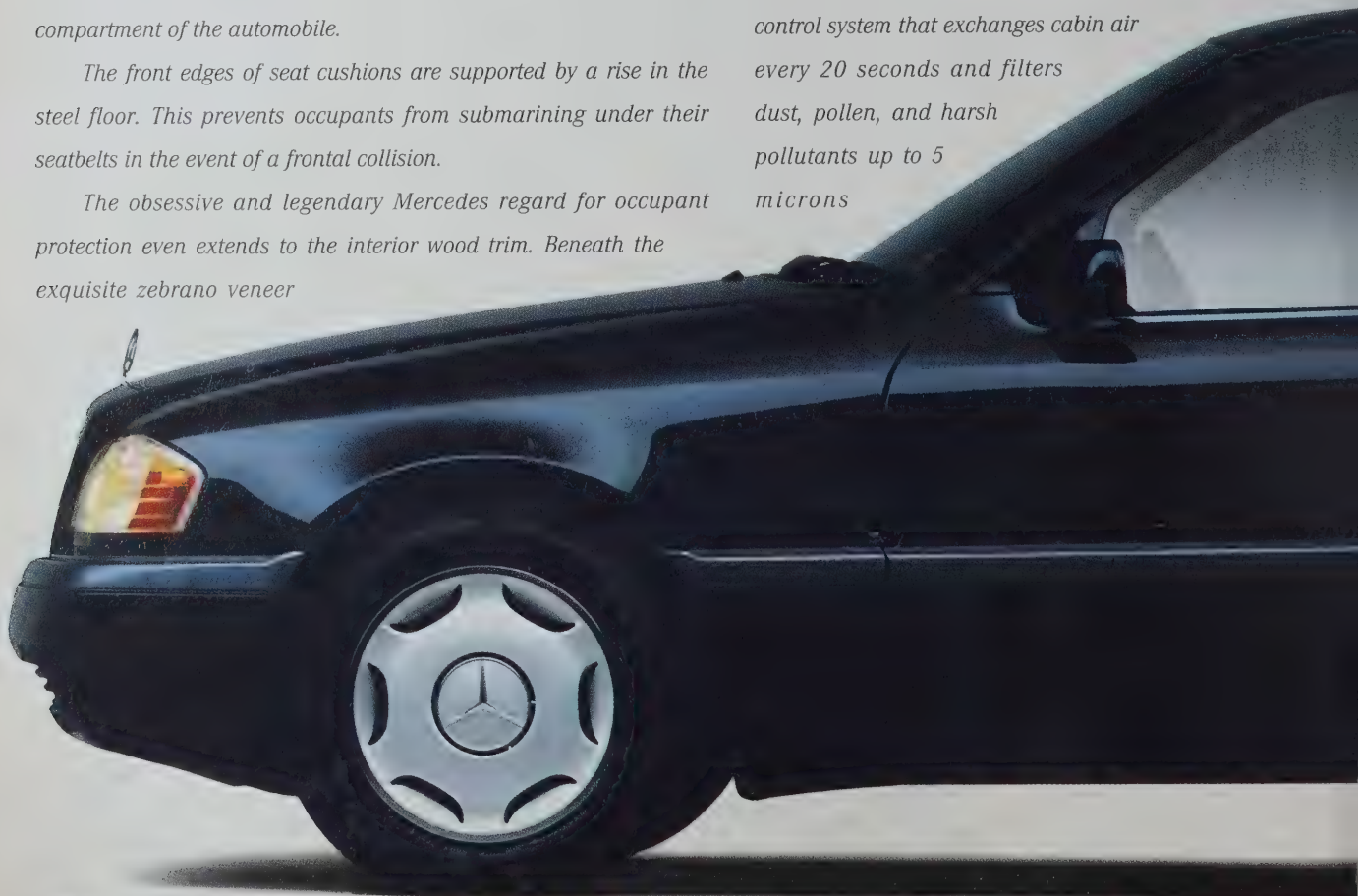
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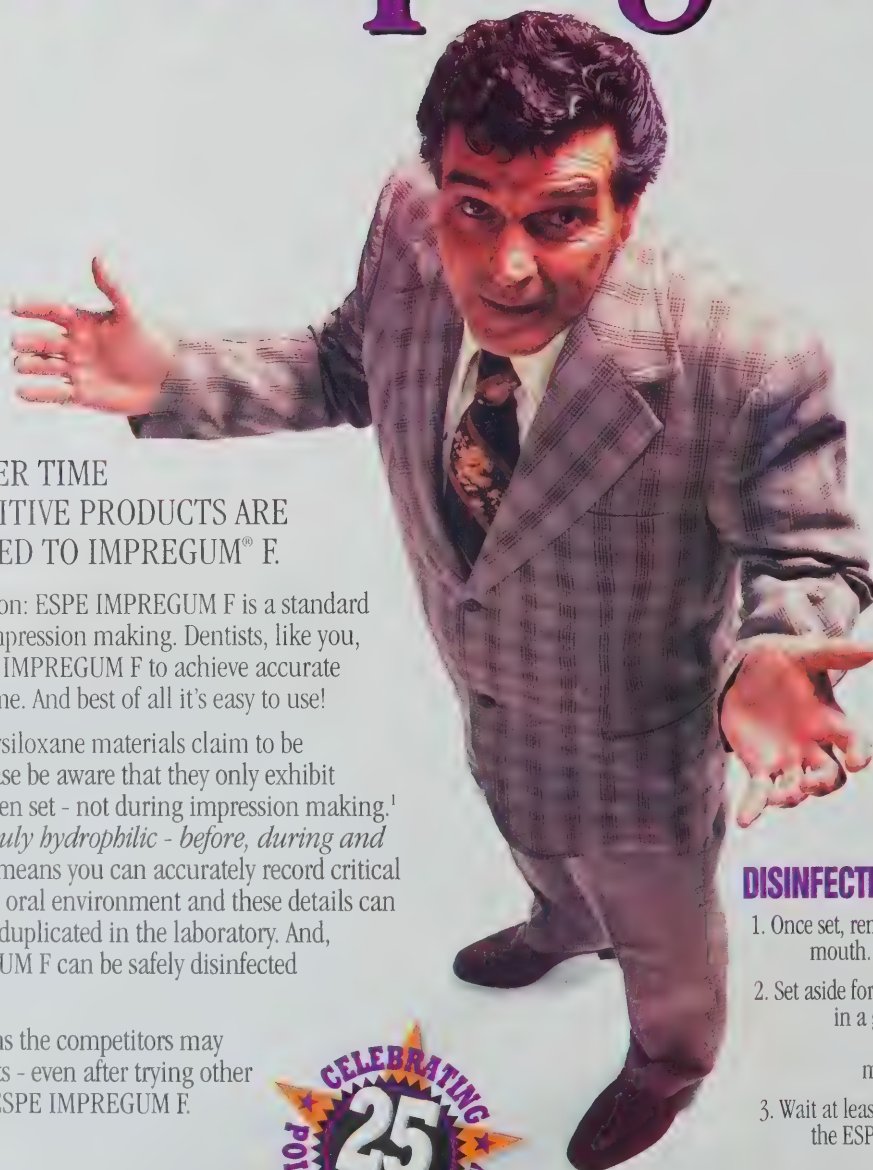
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1. Clin., Dent., Vol. 4. C 36.

2. Dimensional Stability of Elastomeric Impressions After Long Term Disinfection, C. Habib, C. Smith, G. Kugel, A. Aboushala (Tufts University School of Dental Medicine, Boston, MA USA)
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This month's library package features articles on tooth replantation. The package is available to CDA members at a cost of \$5 (plus applicable taxes). To obtain your package, call 1-800-267-6354 or 613-523-1770, ext. 223, 234, 226, 270, or 271; or fax us at 613-523-6574. This package is comprised of the following articles, obtained through a MEDLINE search.



Tooth Replantation

1. Abbott, P.V. Self-replantation of an avulsed tooth: 30-year follow-up. *Int Endod J.* Jan. 1991; 24(1):36-40.
2. Andreasen, F.M. and Dugaard-Jensen, J. Treatment of traumatic dental injuries in children. *Curr Opin Dent.* Oct. 1991; 1(5):535-50.
3. Barnett, R.J. et al. Intentional replantation: report of a successful case. *Quintessence Int.* Nov. 1992; 23(11):755-7.
4. Bhambhani, S.M. Treatment and prognosis of avulsed teeth. A discussion and case report. *Oral Surg, Oral Med, Oral Path.* Feb. 1993; 75(2):233-8.
5. Croll, T.P. Bonded composite resin/ligature wire splint for stabilization of traumatically displaced teeth. *Quintessence Int.* Jan. 1991; 22(1):17-21.
6. Edmunds, D.H. Actinomyces organisms associated with a tooth intentionally reimplanted two years previously. A case report. *Oral Surg, Oral Med, Oral Path.* Jan. 1991; 71(1):100-2.
7. Fegan, S. and Steiman, H.R. Intentional replantation. *J Michigan Dent Assoc.* 1991; 73(6):22-4.
8. Greiner, J.H. and Hawkins, R.D. Intentional replantation. *Endod Rep.* 1991; 6(1):11-3.
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10. Lengheden, A. et al. Effect of delayed calcium hydroxide treatment on periodontal healing in con-

taminated replanted teeth. *Scand J Dent Res.* Apr. 1991; 99(2):147-53.

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14. Nguyen, N.H. et al. Factors influencing repair and regeneration following replantation. *J Can Dent Assoc.* May 1992; 58(5):407-11.
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16. Skoglund, A. A study on citric acid as a proposed replacement resorption inhibitor. *Swed Dent J.* 1991; 15(4):161-9.
17. Stokes, A.N. et al. Lay and professional knowledge of methods for emergency management of avulsed teeth. *Endod & Dent Trauma.* Aug. 1992; 8(4):160-2.
18. Sussman, H.I. Six-year histology of an avulsed molar reimplanted in a hydroxyapatite augmented socket: a case report. *Compend Contin Educ Dent.* Feb. 1991; 12(2):76, 78, 80 passim.
19. Zervas, P. et al. The effect of citric acid treatment on periodontal healing after replantation of permanent teeth. *Int Endod J.* Nov. 1991; 24(6):317-25.

New Acquisitions

The following titles are new additions to the library collection, and are available for loan to CDA members at a cost of \$5, shipping and handling included.

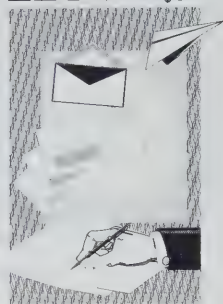
1. Federal-Provincial Subcommittee on Drinking Water, of the Federal-Provincial Advisory Committee on Environmental and Occupational Health. *Guidelines for Canadian drinking water quality.* Min. of National Health and Welfare: 1993.
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3. MacIntosh, R.B., guest ed. *Autogenous grafting in oral and maxillofacial surgery.* Oral and maxillofacial surgery clinics of North America. Nov. 5(4), W.B. Saunders: 1993.
4. McNamara, J.A. Jr. and Brudon, W. L. *Orthodontic and Orthopedic Treatment in the Mixed Dentition.* Needham Press, Inc. : 1993.
5. Meskin, L.H., ed. in chief. *The year book of dentistry.* Mosby Year Book, Inc. : 1993.
6. Rozovsky, L.E. and Rozovsky, F. *AIDS and Canadian Law.* Butterworths : 1992.
7. Tecker, G. and Fidler, M. *Successful association leadership, dimensions of 21st century competency for the CEO.* The Foundation of the American Soc. of Assoc. Executives. : 1993.
8. U.S. Dept. of Health and Human Services. v.1 *Fluoridation census 1992, Communities using fluoridated water adjusted and natural.* v.2 *Fluoridation census 1992, Sept. 1993.*
9. Wilson, T.G., Jr. *ITI Dental implants: planning, placement, restoration, and maintenance.* Quintessence Pub. Co., Inc. : 1993.
10. Yao, F.F. and Artusio, J.F. *Anesthesiology: problem-oriented patient management.* 3rd ed. J.P. Lippincott Co. : 1993.

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February/
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LETTERS

LETTERS



Chlorzoin

I would like to congratulate Dr. Ray Wenn, the president of the Canadian Dental Association, for his November "President's Column" (Another Dental Miracle. *J Can Dent Assoc* 59(11):875, 1993).

Among other things, Dr. Wenn urged caution regarding the media hype that has surrounded the introduction of Chlorzoin into the marketplace. He also mentioned the need to identify the appropriate patient population that may benefit from Chlorzoin, as well as its cost-effectiveness and the extent to which reductions in mutans streptococci will actually reduce dental caries.

Traditionally, from the highest scientific and professional perspectives, a new dental material or procedure must undergo the completion of at least one randomized clinical trial, the publication of the results of that trial in a refereed journal and, subsequently, the scrutiny of the profession prior to being marketed for general use by the profession. My understanding is that this process has not been completed regarding Chlorzoin. The final results of the one trial involving high-carries-risk children, of which I am aware, are not yet available. These results have not been published. However, even if they clearly favor the adoption of Chlorzoin by dentists, they only would apply to similar high-risk children. I have been told that Chlorzoin is being promoted to dentists for patients other than high-risk children.

In my opinion, dentists are not well served by the current marketing of Chlorzoin for broad use by dentists, which I consider to be premature. I agree with Dr. Wenn that dentists' patients and the Canadian public should not be confused by the media hype surrounding Chlorzoin. Dentists should wait until the facts are clearer before using Chlorzoin on the majority of their patients who are at high risk to dental caries.

*D.W. Lewis, DDS, DDPH,
M.Sc.D., FRCD(C)
Faculty of Dentistry
University of Toronto*

Chlorzoin

I read with particular interest Dr. Ray Wenn's November 1993 column, "Another Dental Miracle." It prompted me to remember that as dental students in the 1970s, we were introduced to a similar "miracle" — the immunizations for dental caries — and we all wondered what we were doing in dental school. As it turns out, our fears were not warranted.

Dr. Wenn's comments concerning recent innovations are an important reminder to the profession that things aren't always as they seem, and I applaud him for making the point. While, as a dental researcher in preventive dentistry, I am extremely interested in this new technology, which will probably add to our arsenal in preventive dentistry, it is unlikely that the product will be the great cure that some commercial interests might want us to believe. Clearly, the science to date fails to delineate exactly what effect this new technology might have. Until it does, we are well advised to proceed cautiously.

*D. Christopher Clark, DDS, MPH
Faculty of Dentistry
University of British Columbia*

Response From One Of Chlorzoin's Inventors

In his President's Column in the November issue of the *Journal*, Dr. Ray Wenn correctly urges dentists to

maintain a calm, reasoned approach to Chlorzoin, the prescription drug recently approved for marketing by the federal Health Protection Branch (HPB) for the control of mutans streptococci. Indeed, this is exactly the approach that HPB used during the approximately eight years it studied the drug prior to reaching its decision.

Dr. Wenn also takes the media to task for exaggerations. While these have happened, they have been rare. By our records, the media has reported on Chlorzoin 71 times over the past eight years. The vast majority of this coverage has been factual, though enthusiastic. For example, rarely has it been said or implied that dentists are resistant to new preventive concepts and procedures because of a perceived threat to their incomes or otherwise.

Regardless of the media, the problem remains that, despite the best efforts of dentists and the public, some people still get dental caries. Chlorzoin is not a panacea for that problem, and it would not be responsible to claim that it is. I, and the company marketing the drug (Knowell Therapeutic Technologies, Inc.), are advocating only that dentists include consideration of a new piece of information, the bacterial risk, among the other risk factors for dental caries, and try to do something about it when appropriate.

Dr. D.W. Lewis takes the high road by advocating that no marketing of Chlorzoin should have been allowed until a controlled clinical caries trial had been performed for each specific type of caries and target population. This would mean that, to gain approval for all types of dental caries, a battery of additional controlled clinical caries trials would have to be performed, each for a narrowly-defined clinical situation, patient age, caries rate, rate of saliva flow, tooth surface, protocol for use, etc. Unfortunately, the number of combinations of such trials, the long time required for each trial (approximately four years), and the huge expense (between \$500,000 and \$2 million each), are not possible without the sale of the product

to dentists. Government granting agencies that support research are not permitted to finance such studies. For the time being, lacking these studies, dentists must use their best clinical judgment based on their knowledge of the currently-available research on the biology of the demonstrated effectiveness of the use of chemotherapeutic suppression of mutans streptococci in suppressing caries, and of the relative effectiveness and safety of the various drugs and methods for causing that suppression.

To aid the dentist in making such informed decisions, several sources of information about the scientific background of Chlorzoin and its suggested areas of usefulness are now available. One of these is a review of the use of antimicrobial varnishes for caries prevention, which was published in the November 1993 issue of *Ontario Dentist*. The keener students of the subject can examine the peer-reviewed articles of our original research in the *Journal of Dental Research*, which are cited in the above-mentioned review. Additionally, the company has been very active in providing seminars for dentists wishing to improve their ability to make informed decisions.

James Sandham, DDS, M.Sc., PhD
Faculty of Dentistry
University of Toronto

Response From Knowell Therapeutic Technologies, Inc.

Knowell appreciates the opportunity to respond to the concerns expressed by Drs. Wenn and Lewis in regards to the media attention surrounding Chlorzoin. Chlorzoin is the first prescription pharmaceutical product available exclusively to the family dentist in Canada for the treatment of a bacterial infection that causes one of the two major oral diseases. Chlorzoin's approval has also been widely anticipated by both the Canadian family dentist and the Canadian public over the past few years because of its promise to facilitate more preventive dentistry, because it has been trialed extensively in the Toronto community since 1985, because it has been

awarded a medal for innovation by the government of Canada, and most particularly, because it represents a welcomed form of painless dentistry to the patient. Given this history, it is not surprising that the Canadian media, public and dental professionals have been enthusiastic about this drug.

Knowell has responded to this media attention as follows. First, as spokesman for the company, I have always stated clearly, to all Canadian journalists, that Chlorzoin is approved as an anti-microbial (not an anti-caries) drug, that it is an important adjunctive tool in preventive dentistry, and that Chlorzoin's use should be accompanied by existing methods for achieving good oral hygiene, such as diet management, periodic dental check-ups and routine flossing and brushing. I have been accurately quoted as saying that Chlorzoin is "not a magic bullet" for eradicating tooth decay. I have also provided journalists with the published scientific papers on Chlorzoin whenever possible.

Secondly, Knowell has made considerable effort in educating the family dentist and dental professionals about Chlorzoin, its indications, contraindications, patient selection, patient dosing and application techniques. Drs. Wenn and Lewis may not be aware that Knowell, in the 10 weeks since Chlorzoin's drug approval, has conducted 45 professional education seminars in Southern Ontario and Western Quebec, as well as over 600 comprehensive in-service training sessions, to educate all staff in the dental office on anti-microbial therapy. This commitment to balanced professional education in the dental industry is unparalleled, and will continue across Canada throughout 1994. In Knowell's educational and training program, both in group seminars and in the dental office, we review the extensive scientific literature on streptococcus mutans infections and their role in caries, we cover the product monograph and drug indications and contra-indications, we review the three published scientific papers authored by Dr. James Sandham on Chlorzoin and its anti-microbial properties and, finally, we delve into the protocol of Chlorzoin therapy — the novel procedure de-

veloped by Knowell and its clinical advisors whereby infections are identified with the patient caseload and treated according to levels of risk. Knowell's educational program, by all accounts, has been well received by the dental community as being comprehensive and professional. I would encourage both Drs. Wenn and Lewis to attend one of our seminars in 1994, so that they can form more grounded opinions about how Chlorzoin is being provided to and received by Canadian dentists.

Dr. Lewis indicates that he was told by some third party that Chlorzoin is recommended for patients other than high-risk children. Let me be clear on what Knowell recommends: Chlorzoin should be considered as an adjunctive treatment, by both the prescriber and patient, if the patient has streptococcus mutans levels above 250,000 cfu/mL of saliva and has other signs and symptoms of risk to caries. Knowell's protocol, which was approved by Canada's Bureau of Prescription Drugs of the Health Protection Branch, does not discern treatment or non-treatment by age category, but rather by level of bacterial infection.

Knowell has sponsored research by family dentists in Ontario showing that streptococcus mutans infections span all age groups and, more importantly, reach high levels among the population over 55 (primarily because of limited salivary flow), among patients with lots of retentive sites such as crowns, bridges and orthodontic brackets, among patients in their early 20s, and among young family members where cross-infection of the bacteria occurs. This new and insightful research on the prevalence of oral bacterial infections among the Canadian public will be published by Knowell's clinical advisors in 1994.

Drs. Wenn and Lewis make the argument that more needs to be known about Chlorzoin, its anti-caries properties and its cost-effectiveness. Knowell is committed to providing this information on a continuous basis through comprehensive clinical studies. In 1994, Knowell will be sponsoring several clinical trials of xerostomic patients, geriatric patients, cancer patients and children in North America, Europe, South America and Asia. Just as im-



portant, Knowell is also supporting research on Chlorzoin therapy by and within the family dental practice in Canada.

Knowell has no wish, or indeed the means, to "confuse" the dental professional or the Canadian public as suggested by Dr. Wenn. We appreciate every occasion, such as this letter, to provide the facts about Chlorzoin, our company's credentials as a young, ethical Canadian pharmaceutical company, and to invite all Canadian dental professionals to participate in Knowell's educational program in 1994.

Ross Perry, President
Knowell Therapeutic
Technologies, Inc.
Toronto, Ontario

Thanks from Latvia

I wish to thank the Canadian Dental Association for its donation of two complimentary subscriptions to the *Journal of the Canadian Dental Association* to the Latvian Dental Project. The *Journals* will be placed in the newly-formed dental library at the Latvian Medical Academy (LMA) for the use of both teaching staff and dental students.

My brother, Dr. Peter Apse (formerly of the faculty of dentistry at the University of Toronto) is professor of prosthodontics at LMA, where he is actively promoting the formation of a dental association on the model of CDA.

Peter is the Latvian member of the Latvia Dental Project, which has been working for four years toward the ultimate goal of reconstituting dentistry in this former Soviet republic. We are beginning to see some returns on our efforts, but realize that a long road still lies ahead. Support has been extremely generous from Canadian dental companies, universities, publishers and private individuals. It is most gratifying to have my association join this humanitarian group.

Silvija Janusonis, DDS
Brampton, Ontario.

Family Violence

We just finished reading the specialty features on family violence published in the November 1993

issue of the *Journal*. Every article was excellent and very informative. It will be a real help to us in our practice.

One of the tools we use to combat domestic violence is a mnemonic: MOUTH. It helps us ascertain that our examination and documentation are complete.

M Maltreatment of a child, elder or spouse;

O Orofacial/dental trauma of the abused;

U Unrealistic expectations of the abuser;

T Tissue lesions, STD's, malnutrition;

H History, which should be done privately — it may be the only opportunity for the patient to reveal that abuse is occurring.

B.C. DeMoss, MD
Christopher J. DeMoss
(Dental Student)
Tolleson, Arizona.

Dental Radiation

During a visit to my dentist, I had an opportunity to read one of the Canadian Dental Association's new Dental Information System (DIS) pamphlets, entitled "The Dental Office: Healthy and Safe." In the section on X-rays, following some very useful information on the diagnostic role of radiography, there is a heading in bold print that states: "X-rays are safe." I am quite certain that this unequivocal declaration would astonish the International Commission on Radiological Protection (ICRP), our national professional organizations and governmental radiation protection agencies. Decades of research have vastly reduced the inherent risk of ionizing radiation for patients and dental personnel, but there has never been a proclamation that it has been eliminated.

While acknowledging that there is a risk, the ICRP has developed the risk/benefit concept, which holds that such minimal risk is acceptable if the information gleaned from radiographs contributes to significant treatment benefit for the patient. The operating principles to reduce risk are justification, which is the use of radiation only when clinical examination indicates radiographs are necessary for diagnosis, and optimization, which means that once a

decision is made to prescribe radiographs, then the latest technology is employed to obtain the desired images with the least exposure practical (the so-called ALARA principle). Justification and optimization form the basis for guidelines approved by the CDA board of governors in 1988 and for the current protection procedures recommended by Health Canada for medicine and dentistry.

To support the contention that "X-rays are safe," the pamphlet's authors use an analogy comparing the "tiny" amount of exposure received by a patient during dental radiography to the natural radiation exposure received during a 60-mile car ride. At least this is a change from the walk in the sun comparison that was fashionable some years ago. These attempts to trivialize the concern about radiation exposure in the dental office are based on the fact that dental radiation comprises just one to two per cent of total patient exposure in the health sciences. The premise that dental radiation is safe because the amount used is but a fraction of that used in medicine might be tenable if dental radiation could be judged separately. However, it is the same ionizing radiation used in medicine, and the patient is the same, as are the effects of the cumulative dose. Of course, exposed tissue cells cannot identify the source. The proposition that our radiation is safe on the basis of an artificial separation is merely an artifice. As a profession that makes use of radiation, surely we must share the responsibility with all users in the health professions to practise according to internationally accepted principles.

There is another statement in the X-ray section that is inconsistent with CDA's guidelines. The text observes that on the patient's first visit, the dentist "will generally want to take X-rays to get a complete picture of your dental health. Otherwise, X-rays are used only when necessary." Surely the last part of the quotation implies that routine X-rays, generally taken for new patients, are not always necessary. The authors of this section are promoting baseline radiography, a euphemism for screening radiography, which is now considered unacceptable practice according to the principle of



justification. As well, the word complete in the context of this statement is not likely fortuitous. There is a tradition in the teaching of oral radiography that complete mouth examination requires complete radiographic coverage of the teeth. In earlier times, this meant routine screening with a full mouth series of periapical films plus bitewings, but may now be achieved by substituting a panoramic film plus bitewings. It is not appropriate that a public information system of the CDA should recommend radiographic practices that contradict practices approved in current CDA guidelines.

The DIS is an important initiative that provides a most useful information service to the public. It is essential, however, that the contents be consistent with the DIS advertising claim in the CDA *Journal* that: "it is information you can trust," and, further, that "every fact, every statement, every idea has been checked and checked again." In my view, the X-ray section of this pamphlet does not meet the professed standard.

*Russell G. Stephens, DDS, M.Sc.
Faculty of Dentistry
University of Western Ontario*

Editor's Note

Please refer to this month's editorial, "Feathers in the Wind." Once released, the printed word is hard to retrieve. Those responsible for the Dental Information System assure us that the pamphlet will be reviewed and Dr. Stephens' comments will be seriously considered.

Media Frenzy

For some time, I have been both observer and close participant in the "fraids" media frenzy, as it applies to the dental community in Canada. Repeated newspaper and magazine stories, plus the television programs *Prime Time News* and *Street Stories*, have dragged Canadian dentists into a fray they don't enjoy. Numerous *Journal* articles, letters, and editorials have made our otherwise dull dental community participants in heated debates.

There is, however, a larger picture to all this media involvement. The issues of fluoridation, mercury amalgam, infection control and dental insurance fraud are not just

all media frenzy. They are legitimate problems that are not going to go away if we continue to stick our heads in the sand. We cannot afford to be irresolute in facing the issues of the day. Remember, it was Mikhail Gorbachev who said, "History punishes those who delay."

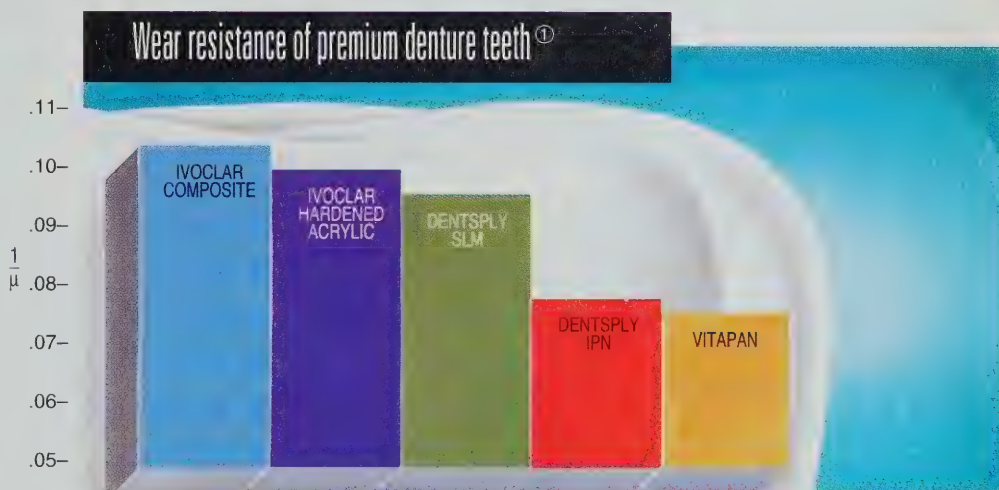
We, as a profession, have brought some of this on ourselves — it is not just a case of "dentist-bashing" by the media. Whether we like it or not, the media (the public's

watchdog) and our patients are confronting us and asking questions.

Rather than digging in our heels and running around stamping out fires, a more proactive approach would serve us better. Change is something we find most difficult. Our own worst enemy is the status quo — often disguised as the "dignity of the profession."

*Conrad B. Sonntag, B.Sc., DDS
Redcliff, Alberta*

Study proves superior wear resistance of Ivoclar denture teeth.



Numerous independent studies and years of clinical experience have proven it — Ivoclar denture teeth deliver the longevity and wear resistance clinicians demand for their patients.

A pivotal study was led by Dr. Karl Leinfelder of the University of Alabama School of Dentistry. The study concluded: "All of the Ivoclar teeth were more wear resistant than the Dentsply or Vita competitive brands tested." It also noted: "This major improvement in wear resistance provides great assurance to the dentist that these materials offer him/her a great alternative to porcelain. In addition to excellent resistance to wear, such materials [Ivoclar denture teeth] are considerably less abrasive to the opposing dentition."

Ivoclar... the world's most beautiful tooth

Ivoclar teeth are available in high quality hardened acrylic, composite or porcelain. All are layered to duplicate the vitality and function of natural dentition. Make your next denture your best — the most beautiful and the most wear resistant. Contact your laboratory or call Ivoclar Williams toll free. U.S., 1-800-533-6825. Canada, 1-800-263-8182.

^① *Wear Rates of Various Types of Prosthetic Denture Teeth.* J.F. Farmer, M. Mirshahid, K.F. Leinfelder (University of Alabama School of Dentistry), *J Dent Res* 71, 1992. #426. Plus internal report by K.F. Leinfelder.

IVOCALAR WILLIAMS

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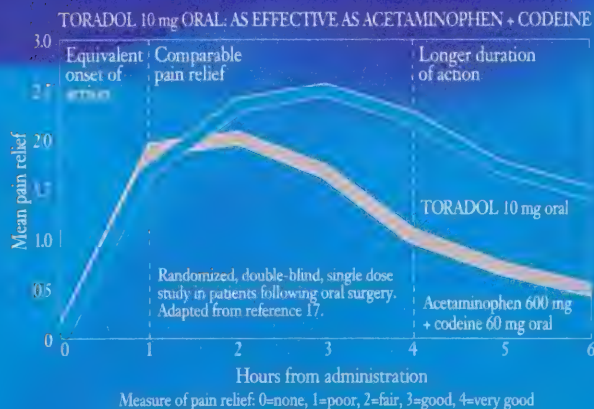
TORADOL

Providing highly effective relief in acute dental pain.



Current strategies in acute pain management suggest a non-narcotic analgesic should be used first, before a narcotic is considered.¹⁰

Toradol (ketorolac tromethamine) oral has been proven effective in acute post-dental surgical pain such as third molar extraction pain and mandibular pain.^{17,18,62} Toradol may also provide effective relief for your patients suffering from toothache pain and endodontic/periodontic pain.



Unlike narcotics which work at the CNS, Toradol works peripherally, at the site of the pain,^{21,58} and therefore has a lower incidence of nausea, dizziness, drowsiness and constipation.^{17,18,21,22} The lower CNS side effects may be of particular benefit to patients who need to drive, operate machinery and remain alert or active.

By class, Toradol belongs to the non-steroidal anti-inflammatory drug (NSAID) family. However, unlike conventional NSAIDs, it is a potent analgesic agent with minimal anti-inflammatory and antipyretic activity. As with all NSAIDs, the most common side effects with Toradol involve the G.I. tract.

With proven efficacy and patient tolerability, Toradol oral is a logical first choice in the short-term management of acute dental pain.

TORADOL
10 mg tablets & 30 mg/mL IM injections • KETOROLAC TROMETHAMINE

Effectively treating acute pain

NEWS UPDATE

Jerry F. Sirdar Memorial Fund Established at U. of Alberta

A memorial fund has been established in honor of Dr. Jerry F. Sirdar, who died suddenly November 29, 1993, in Edmonton, just two weeks after his selection as the executive director designate of the Alberta Dental Association (ADA).

Dr. Sirdar was to have become ADA's executive director December 31. He would have replaced Dr. Bruno Martinello, who recently retired from the position after many years of service.

A 1969 graduate from the faculty of dentistry at the University of Alberta, Dr. Sirdar spent the majority of his dental career in Alberta, both in private practice and as a part-time clinical instructor at the University of Alberta. Immediately prior to accepting the executive director's position with ADA, Dr. Sirdar had served (1991 to 1993) as a senior lecturer at the University of the West Indies, St. Augustine School of Dentistry, in Trinidad and Tobago.

With Dr. Sirdar's death, the ADA board has appointed Dr. Richard Sandilands, a past president of ADA and a member of CDA's executive council, as the association's interim executive director. Dr. Sandilands assumed his new post January 3. He is expected to serve in that capacity until a special search committee of ADA has had an opportunity to identify candidates for the executive director's position and make a final recommendation to the association's board.

Donations to the Jerry F. Sirdar Memorial Fund may be made to the Faculty of Dentistry, c/o Dentistry/Pharmacy Building, University of Alberta, Edmonton, Alberta T6G 2E6. ■

CDAnet a Go In B.C.

CDAnet — CDA's answer for the electronic data interchange of dental claim forms — has accomplished a major breakthrough in British Columbia.



Celebrating the successful conclusion of CDAnet negotiations in British Columbia are (left to right): Mr. Bob Bucher, CU&C; Dr. Don MacFarlane, CDAnet committee; Mr. John Seney, MSA; and Dr. Larry Rossoff, vice-president, College of Dental Surgeons of British Columbia.

After almost three years of negotiations, an agreement of implementation has been reached between the College of Dental Surgeons of B.C., CDA, and the major carriers of dental plans in B.C. — CU&C and the Medical Services Association (MSA).

The agreement, which will go into effect this spring, opens the door for the more than 2,300 dentists in B.C. to transmit over 90 per cent of their dental insurance claims electronically.

B.C. dentists interested in joining CDAnet, or who want more information on the system, are urged to contact Mrs. Pat Duminy at the CDAnet office in Ottawa. CDAnet's convenient toll-free number is 1-800-267-9901, ext. 261. ■

International College of Dentists Responds to World Dental Needs

From helping stomatological schools in the former Soviet Union to improve their dental education standards, to providing emergency treatment to people in Honduras who had no previous access to dental care, the International College of Dentists brought help and assistance to areas of distress around the world in 1993.

Founded in 1927, the college represents 7,500 dentists worldwide, including 430 in Canada. A Canadian, Dr. Irving Siegel of Toronto, has served as president of the organization for the past 18 months.

In February 1993, the World Health Organization (WHO) and the European section of the International College of Dentists arranged for a group of international dental education experts to visit three stomatological institutions in Eastern Europe. The three schools all had one thing in common. Each of them — at Minsk, in Belarus; Riga, in Latvia; and Moscow, in Russia — was located within the boundaries of the former Soviet Union.

The team was made up of visiting academics from five Western European countries. Facing them was the task of updating the schools' old curricula, which was based on the military and socialist concepts that had held sway during the previous 40 years of communist rule. It was a daunting challenge, given that this curricula bore no relevance to the concepts of the modern world of science.

In the end, the visiting team's proposals were met with almost total acceptance by the participating dental institutions. The broad spec-

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trum of subjects addressed during the final plenary session included cross-infection, lack of work load, the total absence of preventive care, and a revised curriculum equated with those presently followed in Western Europe.

In another area of the world, the Australian section of the college responded quickly when a tornado destroyed all dental facilities in Western Samoa. Within days, with the help of local dental distributors, the college had replaced X-ray machines, chairs, units, instruments and dental supplies.

In Honduras, the Canadian section of the college, led by Dr. Keith Morley of Barrie, Ontario, provided weeks of emergency treatment to people suffering from years of dental neglect. One of the poorest countries in Central America, Honduras has only one dentist for every 10,000 people, no dental hygienists, and outdated equipment. Since the Honduras visit, a college committee chaired by Dr. George Peacock of Saskatoon is initiating plans to provide more permanent dental and preventive education for the natives of the area. ■

Health Canada Invites Research for Two Health Related Programs

Health Canada's National Health Research and Development Program (NHRDP) is inviting participants to compete for two health-related research programs.

The Seniors' Independence Research Program (SIRP) has announced a competition — with a five-year budget of \$17 million in contribution funds — to establish up to 11 programs of applied research on health, social, and economic issues related to seniors' independence. Four main theme areas have been selected for the program: financial, medication use, mutual/self help, and evaluation of systems.

Applications for funding must be received by Health Canada before March 23, 1994. For more information, contact: Linda Murphy, NHRDP, Health Canada, Ottawa,

Ontario K1A 1B4; tel: (613) 954-8546; fax: (613) 954-7363.

The second program, Canada's Drug Strategy — Phase II, has been established to introduce a program of research aimed at reducing the harm caused by substance abuse to individuals, families and communities. Five target populations have been identified for research: children (7-12), youth (13-17) and young adults (18-24); women; seniors; off-reserve aboriginal people; and impaired drivers.

More information can be obtained from Suzanne Caya, Program Development Office, Extramural Research Programs Directorate, Health Canada, Ottawa, Ontario K1A 1B4; tel: (613) 954-8557; fax: (613) 954-7363. Applications for funding under this program must be received by Health Canada before March 31. ■

Health Canada Confirms Blood Products Are HIV Free

Health Canada is advising Canadians that blood products made from German plasma for distribution in the Canadian market are free of HIV.

In a November 26, 1993, press release, Health Canada said: "In light of recent concerns about blood products made from German plasma, Health Canada officials have inspected the Immuno AG manufacturing facility in Vienna, Austria, and confirm that the procedures followed by the company assure the safety of the products it makes for the Canadian market. Health Canada is confident that all products are free of HIV.

"Recent attention has been focused on two Immuno products — immune globulin and Factor IX. Concern for these products was raised when it was revealed they were prepared, in part, from plasma obtained from a German firm, UB Plasma. That company was closed by German authorities because of deficiencies in testing. When Health Canada was informed of a potential problem, it immediately contacted all companies distributing blood products in Canada.

"On November 5, Immuno Canada informed officials at Health

Canada that it was withdrawing one lot of immune globulin which had been manufactured, in part, with plasma from UB-Plasma in Germany. Immune globulin is used most frequently to protect travellers against Hepatitis A.

Health Canada reiterates that this product does not pose a health risk as steps are included in the manufacturing process to remove or destroy HIV and hepatitis viruses. Immune globulins manufactured by this process have been marketed for decades and no reports of hepatitis or AIDS have been attributed to their use.

On November 15, Immuno Canada notified Health Canada that two expired lots of Factor IX had been prepared, in part, with plasma purchased from UB Plasma. (Factor IX is a coagulation product used by persons with Hemophilia B.) Health Canada issued an "Alert" to say the product was not considered a health risk as it had undergone a viral inactivation process.

After consultation with Health Canada, the Canadian Red Cross, which distributed Factor IX for Immuno, began tracing the distribution of the affected lots and seeking the return of any unused material. It notified all hospital blood banks and hemophilia treatment programs that received the two lots of Factor IX. Patients are being contacted. Unused products are to be returned to the Red Cross. Blood banks and treatment centres are further requested to report the results of these actions to the Red Cross. There may be up to 400 Factor IX users in Canada.

All other companies distributing blood products in Canada have confirmed that German plasma is not used in their products. ■

Obituaries

Leishman, Dr. John Charles: Dr. Leishman graduated from the University of Manitoba faculty of dentistry in 1970 as the gold medalist. He practised dentistry for 23 years in Fort Frances, Ontario, where he was an active member of the Kenora-Rainy River Dental Association. He died November 1, 1993, at the age of 46.



FIGHTS CAVITIES

Trident

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AVEC

COMBAT LA CARIE

Reduce cavities by up to 62%.*

A two year study now proves that Trident[†] gum, when chewed in conjunction with a program of regular oral hygiene, actually reduces cavities by up to 62%.*

Trident has been granted approval for this claim because a study has shown that Xylitol, used in Trident, significantly reduced the DMF increment among a large research population.

Xylitol, or Dentec[‡] - a name we developed to aid consumer awareness - disrupts the plaque matrix which contains the caries-causing streptococcus mutans.

Consequently, Trident gum which contains 15% Dentec/ Xylitol, provides an anticariogenic benefit that other gums do not.



In addition, Trident gum is now recognized by the Canadian Dental Association, which is significant for the fact that it is the first gum to be so acknowledged.

What this means is, now, dental professionals can recommend, with confidence, Trident gum with Dentec as part of a complete program of oral hygiene. For more information call 1 800 263 9060.



We'll give you a mouthful.

And more.

Because at Dentsply Canada, we provide a full range of the highest quality materials for restorative, preventive and prosthetic applications.

Through the years, our extensive research and development efforts have definitely paid off for the entire dental community.

No matter what your needs are, you'll find consistent reliability and unmatched performance from all products across our main divisions. In the past, each division has, independently, been serving the dental industry. Now each has been reorganized to match product to specialty — and all are united under Dentsply Canada.

For Dentists
(Caulk) Dentist Division.

For more than a century, Caulk has been a leading name in

dentistry, with state-of-the-art products such as Prisma TPH, ProBOND, Enhance, Dispersalloy and Reprosil — all classics in the industry, that make it easier for dentists to be more efficient and effective in their practices.

For Hygienists
(Ash) Hygiene Division.

This new innovative division has been formed to fill your preventive and asepsis needs. You'll recognize such outstanding examples as Delton, Nupro, Rite-Angle, and the entire family of Cavitron products, featuring the new Steri-Mate sterilizable handpiece — all products you can count on.

For Prosthetics
Laboratory Division.

The best fit, the best look and the best wear — that's what dental laboratories across the country have come to expect from Dentsply Canada. Our artificial teeth, including our Trubyte

products, SLM and IPN, offer the most complete line of shades and moulds available in Canada. And in The Lab merchandise area, such tried and trustworthy products as Triad, Jeltrate and Lucitone, have raised standards of excellence in the industry.

Across all our Dentsply Canada divisions, we're committed not only to making the highest quality and broadest range of dental products but also to making those products conveniently available to you. That's why we work with only the leading dealers across the country, offering you the best service and the fastest delivery.

We'd like to tell you more about everything we can do for you, and, about our new Implant Division. Admittedly, it's a mouthful. But you'll be hearing from one of our representatives very soon, and it's well worth a listen.

DENTSPLY
CANADA

Offering you the full treatment.

Obituaries

(continued from page 100)

McCormick, Dr. R.H.: Dr. McCormick graduated from McGill University's faculty of dentistry in 1963. He died in October 1992.

Miller, Dr. Kenneth: Dr. Miller graduated from McGill University's faculty of dentistry in 1950. He died in November 1993.

Onischuk, Dr. Nestor: Dr. Onischuk practised dentistry in Edmonton, Alberta, until his retirement in 1967. He died on November 1, 1993.

Shutiak, Dr. Brian J.: Dr. Shutiak graduated from the University of Saskatchewan's faculty of dentistry in 1981. He died on November 18, 1993.

Wood, Dr. Harris Solomon: Dr. Wood graduated from the University of Toronto's faculty of dentistry in 1949. He also earned a degree in prosthodontics from the University of Southern California in 1966. Dr. Wood was a life member of the Canadian Dental Association. He died on November 6, 1993.

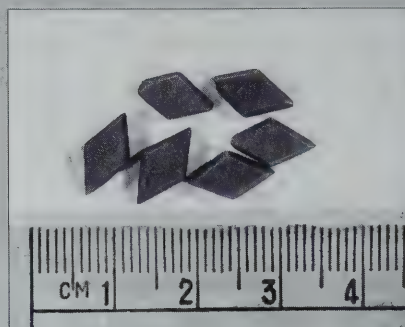
Young, Dr. Gordon R.: Dr. Young died December 23, 1993, in Surrey B.C. Born in New Westminster in 1927, he graduated from the faculty of dentistry at McGill University in 1951, and was the gold medalist in his class. Dr. Young practiced in Surrey from 1952 until his retirement in 1989. ■

"WHAT'S IT?"

This month's "What's It?" mystery objects are grey, diamond-shaped particles, each stamped with the S.S. White symbol. Although not fragile enough to be crushed, the particles can be fractured with moderate finger pressure.

If you know what these particles are, and how they were used in dentistry,

please contact: Dr. Ralph Crawford, Editor of the *Journal of the Canadian Dental Association*, 1815 Alta Vista Drive, Ottawa, ON K1G 3Y6. ■



6th National Conference on Special Care Issues in Dentistry

April 15-17, 1994
Chicago Sheraton Hotel and Towers

Co-sponsored by the
American Dental Association
and the

**Federation of Special Care Organizations
in Dentistry**

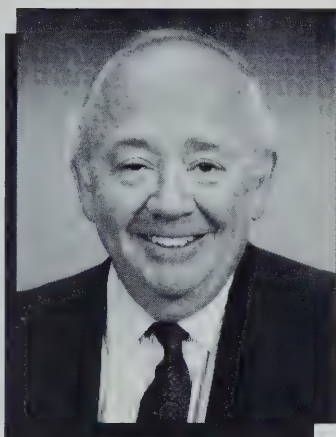
The program consists of multifaceted considerations in the development of care for the special needs patient. Topics include: health care accreditation, training dental professionals in different service models on oral care for older adults, dental considerations for the diabetic and psychiatric patient, esthetic restorations, tuberculosis risk, biomedical ethics, screening, case presentations, etc.

Contact

Federation of Special Care Organizations in Dentistry
211 E. Chicago Ave., 17th Floor
Chicago, IL 60611

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"By Dentists, For Dentists": What CDSPI's Watchword Really Means

Dr. Rod Moran

President of CDSPI

The other day, a fellow dentist asked me what Canadian Dental Service Plans Inc. (CDSPI) really means when we say we're "by dentists, for dentists." I think he had an image of 50 dentists locked away in an office, earnestly drafting a new insurance plan.

Actually, there are various ways to explain the "by dentists, for dentists" concept. But the best method is through example, and a perfect opportunity has arisen to do precisely that.

CDSPI is now offering an updated accidental death and dismemberment (AD&D) insurance plan, which includes many significant improvements. Both the dentist I was speaking to — and you — may gain new insight into CDSPI's operation by hearing about how the improved plan came to be and what it provides.

"By Dentists"

Let's first look at "by dentists." No, there's not a room full of dentists working madly on your behalf. There is, however, a group of insurance professionals at CDSPI who work on behalf of Canada's dental profession to find and develop the right insurance and retirement plans for you. At the same time, there's a management team and board of directors — made up entirely of dentists — who direct the progress of CDSPI and authorize

every major step the company takes. And all changes that CDSPI makes to any of the plans must first be approved by our owners, the Canadian Dental Association and the co-sponsoring provincial dental associations.

Together, all these people look out for your best interests — and respond to your unique needs. All changes to existing products and the addition of new plans are based on extensive input from dentists practising across Canada.

In the case of AD&D insurance, enhancing the product meant asking dentists to examine the existing plan and to suggest how it could be improved. CDSPI also looked at other products in the marketplace with the goal of locating a better plan for you.

As it turned out, we found an insurer — American Home Assurance Company — that could offer an AD&D plan with better coverage and substantial premium reductions. So we changed your plan to American Home.

The "by dentists" concept goes even further, however. The group buying power of the dental profession often gives CDSPI the strength not only to negotiate competitive premiums, but also to contract special provisions with the insurers. For example, the updated AD&D plan includes coverage for certain accidental injuries that pertain spe-

cifically to the practice of dentistry. That's what we mean by meeting dentists' unique needs.

"For Dentists"

Let me explain the "for dentists" concept by telling you exactly how you benefit from the updated AD&D plan. Actually, because you benefit in so many ways, all I can do is provide a few examples:

- The maximum coverage has been increased from \$250,000 to \$500,000. And the plan has been simplified, too. Instead of three levels of coverage, there's now just one level. This level is even more complete than last year's comprehensive coverage, and it's offered at a lower rate than last year's basic coverage.
- New benefits, including a provision for a \$100-a-day payment during hospital stays, a payment of up to \$10,000 for travel costs when an immediate family member has to travel to visit the injured person at the hospital, and a payment of up to \$10,000 for new occupation training for an insured member.
- If you're insuring dependents, this year's family coverage gives your spouse and children significantly improved coverage compared with the previous dependents' AD&D plan.
- New benefits for family coverage, including payment of de-

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Fund	Unit values at		12 Month Return %
	December 31, 1993	November 30, 1993	
Bond & Mortgage Fund	11.61059	11.38944	15.3%
Common Stock Fund	23.65275	23.39536	30.8%
Money Market Fund	66.00668	65.76281	5.3%
Balanced Fund	43.41191	42.74203	17.6%

G.I.C. Fund

Term	December 31, 1993	November 30, 1993
1 yr	4.05%	4.55%
2 yr	4.50%	4.80%
3 yr	4.85%	5.25%
4 yr	5.20%	5.60%
5 yr	5.80%	6.05%

(*Rates subject to change without notice.)

Total Assets (market value) of the Plan as of

December 31, 1993	November 30, 1993
\$191,621,838.71	\$191,169,265.00

For further information:



CDSPI

Write:

CDSPI

Retirement Services Dept.
Suite 710
100 Consilium Place
Scarborough, Ontario
M1H 3G8

or phone, toll free:

416-296-9401 Metro Toronto
1-800-561-9401 Service in English
Extensions:
252, 253, 254
1-800-665-9401 Service in French
1-416-296-8920 Fax.

pendent children's day care costs and continuing AD&D family coverage after the participant turns 70 or dies.

Details of these and other single and family coverages available through the plan, as well as the applicable restrictions, may be obtained by calling a CDSPI personal service representative.

As I mentioned before, the plan has been tailored to our profession — right down to coverage against the types of accidental injuries that are particularly serious for dentists, and that are usually not covered in other, more general, AD&D plans. For example, the loss of the thumb or index finger of the dominant hand, or the partial loss of sight in one eye are covered.

We've been sure to maintain all the outstanding features of last year's AD&D plan, including the provision that no medical or health questionnaires are required to obtain coverage.

The well over 6,000 dentists who participate in this plan can now keep their premiums at the same level — or reduce them — while raising coverage to the maximum level and getting even better protection. Those who don't currently benefit from the plan now have even more reason to consider the Canadian Dentists' Insurance Program (CDIP)'s AD&D coverage.

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CDSPI



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FINANCIAL PROGRAMS DESIGNED BY DENTISTS FOR DENTISTS

IMMEDIATE DENTURE INSERTION

by *John A. Bothwell, DDS, Toronto, Canada*

The question of whether to insert dentures immediately following extraction or to wait until the tissues are healed is one of the controversial questions that has caused some concern to the dental profession for a great many years. Today we have enough evidence, both scientific and practical, that there is no disputing the fact the "immediate insertion," if properly done, is the best possible service that can be rendered to the patient who has had the misfortune to lose his teeth.

In this consideration of "immediate insertion," there is certainly no place for the old idea of the artificial teeth being set in the sockets of the recently extracted natural teeth. In every case, a labial and buccal gum is necessary for a successful result.

For many years, I have been using different techniques for this service, and have now developed one that is simple and yet adequate, a technique which gives the most wonderful satisfaction both to the patient and myself. It results in having firmer and healthier tissues over a regenerated bone, brought about as a result of the stimulation of mastication; and from the viewpoint of aesthetics, the patient never has to appear without teeth. Dr. Boyd Gardner of the Mayo Clinic, Rochester, Minnesota, said before the New York State Dental Society in May, 1934, "In post-operative care we are interested in that management which will result in early repair of tissues, and immediate dentures appear to meet the demand for such results. I appreciate that reference to such management has been made by others, so my reference is merely to add emphasis. We must consider that the impressions are made of soft tissues only, and therefore the more uniform the oral surgeon leaves the soft tissues after extraction, the more uniform will be the denture. Moreover, one must appreciate that the denture bone becomes a matrix, and as the alveolar process repairs, it will do so more uniformly if the denture which constitutes the matrix does not reflect irregularities that so often are the result of lack of attention paid to trimming, suturing and so forth, by the oral surgeon. This stimulus to resistance by the den-



JOHN A. BOTHWELL

ture is obviously the same as surgical cement offers in the so-called surgical treatment of pyorrhea. Perhaps the phrase "resistance stimulation" could be coined to exemplify such phenomena. A similar idea is utilized by some orthopedic surgeons in fractures of, for instance, the femur. Even though the roentgenogram reveals the bones to be in good apposition and so held by a suitable cast, repair fails to take place until the patient is encouraged to get up and walk; by so doing, pressure is brought about on both proximal and distal ends, which results in stimulation and brings about repair. The work of Jones and Roberts on calcification, decalcification and ossification further emphasizes the part exercise plays in calcification, or perhaps a better term would be "mineralization," as reference is made to minerals other than calcium. Immediate dentures make postoperative hemorrhage easier to control, and last, but not least, the morale of the patient is sustained, as the mandible will then not be allowed to move in closing to a point not heretofore experienced." As a result of this regeneration or "mineralization" of bone, the postoperative change in the ridge tissue is very little, a feature greatly to be desired. In my prac-

FEBRUARY, 1935

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tice, many dentures are worn a year and sometimes nearly two without any noticeable change in the ridge tissues. Because of these results, noted from a close observation over a long period of time, I feel every practitioner owes it to his patient and to himself to use the "immediate insertion" technique.

Tissue-Mould

Even if only a few teeth at a time are being extracted, I firmly believe that the ideal treatment is the insertion immediately following extraction of what I have chosen to call a "tissue-mould" or "tissue-adapter" with an occluding surface, for each edentulous area. The method of attachments for these "moulds" must be determined by the operator, as each case presents a different problem. These "tissues-moulds" serve as real bandages or matrices for the tissues, and the bone regeneration begins immediately just as if the permanent denture were in place. As more teeth are extracted, the "tissue-adapter" may be increased in size to cover these areas. And these "tissue-moulds" are worn until in my judgment the mouth is ready for the permanent restoration. When the permanent restoration is to be a full denture, I sometimes leave the six anterior teeth to be extracted immediately before the permanent denture is inserted. When this is done the permanent denture serves as "tissue-mould" for the anterior areas.

In certain types of cases when a complete extraction is to be done and where all teeth may be extracted at one sitting, I insert the permanent denture immediately and it serves as "tissue-mould" for the whole maxilla or mandible, as the case may be. Then, instead of a second denture, when oral conditions warrant it, a rebasing operation is done.

Method of Procedure

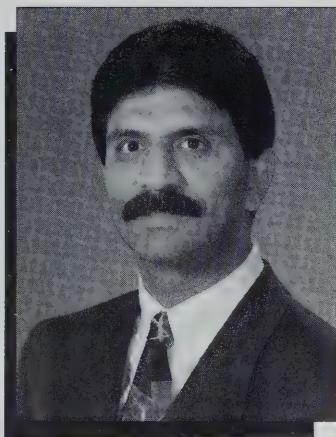
Below is my average procedure for every prosthetic case, even where the whole mouth is edentulous. I modify or enlarge upon this as different cases warrant it. I begin with a thorough clinical and full mouth X-ray examination. The X-ray examination tells the story not only of apical conditions, but of the condition of the bone throughout the mouth, and reveals any fragments of roots. We should all be certain for our own protection that we are inserting dentures on perfectly healthy tissue. My next step is to study models of the mouth, articulate them and plan and record my procedure just as an engineer would draw his plans and make his specifications for a piece of construction work. In dentistry, this may be summed up in the words "diagnosis and advice." The succeeding

steps follow in this order: a shadowgraph or profile record made radiographically; a facial cast which provides a permanent record of the facial contour; two sets of models of the anterior teeth — one for esthetic purposes from which the length, width and form of the natural teeth should be noted, and the other to aid the exodontist in the alveolectomy operation; a model procured from labial impression with the anteriors in a natural closed position, to show the relation as to overbite and overjet; and finally a working model to be procured from a full impression — preferably sectional. The bite operation will follow and then a try-in for the edentulous areas for checking the esthetics and the bite; and finally, the finish of the denture. The remaining teeth will be extracted on the day the finished denture is inserted. With all the information, the examination, records and our general knowledge in denture technique, we can hardly go astray.

Diamond Jubilee of Publication

Throughout 1994, the Journal of the Canadian Dental Association celebrates 60 years of publication as the authoritative "voice" of dentistry in Canada. Each month, in commemoration of its Diamond Jubilee, the Journal will reprint an article from Vol. 1, 1935.

This month's feature by Dr. Bothwell emphasizes principles in immediate denture placement that are as valid today as they were 60 years ago.



A Necessary Mindshift: Why You Should Re-engineer Your Practice

Imtiaz Manji, B.Sc.

President of ExperDent

As a management consultant for dentists, I've visited a fair number of dental offices over the years. Yet a decade and several hundred visits later, I'm still fascinated by what I see. Most compelling is the fact that while management styles vary so widely from one practice to the next, there are common threads at the root of all the truly progressive, successful practices. It's also interesting to note that the last few years of tough economic times have served to further entrench these characteristics. If dental practices find something that works, they're not only sticking to it, they're looking for ways of making it work even better.

Whether they recognize it now or not, these icons of success were — and are — re-engineering their dental practices to meet the new demands of the profession. As I mentioned in last month's column, the concept of re-engineering is gathering steam in the corporate boardrooms of North America. But savvy small businessmen, including some dentists, are feverishly jotting down the re-engineering formula and modifying it to suit their professional needs. They recognize that there is a lot to be gained by monitoring the pulse of the corporate world.

Getting Yourself and Your Team to Embrace Re-engineering

Whether your dental practice is already experiencing difficulties, you sense trouble on the horizon, or you're concerned that you've reached peak performance, it's virtually certain that you'll benefit from applying the principles of re-engineering.

But recognizing that your practice is a candidate for change is not enough. You've got to be willing to embrace change, and that poses more difficulties than you might think. For example, the absence of an entrepreneurial spirit, coupled with intense aversion to risk taking, may render a practice impotent when it comes to the redesign process.

Before you can start over or re-engineer, you've got to accept that change is vital not only to your practice's growth, but in some cases to its very survival. Once dentists adopt this mindset, they're usually willing to do what it takes to get the job done. If there's going to be a hitch in the plan, it will likely be with the other team members. They may resist change because they're comfortable with their traditional ways of doing things (even though these methods may be wholly unproductive).

For re-engineering to work, it's vital to get your team members on

side. As you've probably surmised, holding a staff meeting to unilaterally declare that the practice is about to be re-engineered won't win anyone over. Rather than using this typical top-down management style, you've got to articulate your concerns clearly, and allow the team to come to the sober realization that you're not advocating change for change's sake, but for the sake of the practice's ultimate survival.

Michael Hammer and James Champy, the authors of *Re-engineering the Corporation: A Manifesto for Business Revolution*, believe that two important elements must be brought home before people in an organization will be persuaded to embrace change. The first, called a case for action, states why the company must re-engineer. Whether it's losing its competitive advantage, experiencing declining profits or on the verge of collapsing, the case for action is a powerful message that can get through to those who might be inclined to resist or even fight change. The second element is the vision statement, which spells out what the organization needs to become. It serves as a "goal for which to shoot" and as a guide to the extent of change that's needed.

The "case for action" of a dental practice might read like this:

- Although we are retaining patients, they are not coming in at



the recommended intervals for their continuing care appointments;

- We are disappointed with the number of new patients coming into the practice. This has been steadily eroding for the last year;
- Our competitors in the area are gaining an advantage over us because they offer a greater range of appointment times and services to their patients;
- Patients are dissatisfied with the length of time it takes for them to receive reimbursement from the insurance companies.

Similarly, the vision statement of a dental practice might be:

- We do our best to educate our patients about how to achieve and maintain top-notch oral health. We employ systematic recall procedures that remind patients that they are due to visit our practice;
- In all our contact with patients, we convey that we are a quality dental practice, one that would be happy to meet the dental needs and wants of our patients' friends, families and colleagues;
- Our patients' schedules and desires — not ours — dictate our practice hours and services. We seek ever-better ways of accommodating our patients, from offering weekend appointments to updating our clinical skills through ongoing continuing education;
- Although we do not accept the assignment of insurance benefits, we do the best we can to ensure that patients receive prompt reimbursement from their insurance company. We are now using EDI (CDAnet) to accelerate this process.

Clearly, the vision statement is designed to be broad, sweeping and, hopefully, inspiring. In addition, concrete, specific actions should flow from it. For example, the vision statement on continuing care appointments should read something like this: *The accountability for patients is a shared responsibility among the dentist, hygienist and the administrative team. The dentist impresses the importance of continuing care to the patient, and as such is a key player in*

promoting continuing care. The hygienist, who typically spends the most time with the patient, uses her verbal skills to get the patient to understand the need for continuing care and to embrace it. She is ultimately responsible for retention, although she is supported by the administrative team handling patient follow-up calls and reminders. If slippage results from patients not participating in continuing care, the hygienist must be informed so that she can reactivate patients.

The Three Cs in the Dental Environment

Assuming that you've got your team to participate in re-engineering, the next step is to get them to understand the forces at work in business today, the three C's — customer, competition and change, as described in last month's article — and how they apply to the dental environment.

The patient is to the dental practice what the customer is to business. Today patients choose to consume dental services or to reject them. And their ability to do so will only increase as preventive and so-called elective dentistry (such as cosmetic dentistry) continue to account for an ever greater bulk of the dentistry provided. (Some might even argue that preventive and elective dentistry have already become the mainstay of the profession.) Add to this the simple fact that there are a surplus of dentists for patients to choose from today, and the overall picture isn't hard to see. Patients can take or leave those porcelain veneers, and if they decide to take them, it might not be from you.

Astute dental practices accept the fact that today's patients are consumers. Whether they're purchasing a product or a professional service, they are cost-conscious, selective, educated, and demanding. Yet within this general patient profile, there are individual characteristics that must be identified and considered. In other words, the dental team must pay attention to the personal preferences of each individual patient and customize their approach accordingly.

For example, having a phone and fax machine available might be a plus for upscale business people, but it certainly won't gain you any kudos with the kid who is going through Nintendo withdrawal in your reception area. As a retailer said in a recent issue of Fortune Magazine: "The customer isn't king anymore. The customer is dictator."

Related to the ever-more-demanding customer is the notion of competition. Although dental practices don't face the same intensified competition from globalization as many other small businesses, they shouldn't delude themselves into thinking that the competition in their own backyard is negligible. Obviously, your territory isn't about to be infiltrated by overseas competitors, but the local competition could start to encroach on your turf. All it takes is for one dental practice in the area to sense that there is room to improve on the services provided by the area's established dentists. In raising the ante, these aspiring practitioners re-write the rules of the game, eventually forcing the competition to match their performance.

Change is the third and final C. Dentists already know, only too well, about the near dizzying changes that technological innovations — such as imaging and lasers — are bringing to the delivery of dentistry. But they must also be attuned to the fact that this knowledge does not belong in the "inner circle" of the profession. With the emphasis on healthcare in the media, patients are often aware of new procedures and delivery systems as soon as the dental team is (and in some cases, even before!). They will pose questions and expect the dental team to have quick, accurate answers.

The Stage Is Set

If you've managed to gain an understanding of what re-engineering is and how it applies to the dental environment, and if you've convinced your team that it's a necessary process, the next step is to get it rolling. That's the focus of our March column. ■

CLINICAL



Actinic Cheilitis and Carcinoma Of the Lip

J.H.P. Main, BDS, PhD, FDSRCS, FRC (Path.), FRCD(C)

M. Pavone, DDS

ABSTRACT

During dental examinations, the lips are readily overlooked. Dentists should routinely examine the lips visually and by palpation. Actinic cheilitis is a common condition caused by damage to the lips through exposure to sunlight, and is readily diagnosed clinically. Its progress can be minimized by the use of an appropriate sun screen when outdoors. Actinic cheilitis can undergo malignant transformation into squamous cell carcinoma. The clinical features and management of these conditions are described.

Introduction

Dentists are the best situated of all health care providers to diagnose actinic cheilitis. This common condition is seldom recognised as a significant concern in its early stages. As it slowly progresses over a period of many years, patients typically view the condition as an inevitable part of the ageing process. It is therefore often neglected until it has reached a fairly advanced stage, when the possibility of neoplastic change becomes significant.

In itself, actinic cheilitis is unsightly and can cause considerable discomfort and inconvenience. Early diagnosis and appropriate advice to minimize progression of the condition are thereby desirable to reduce the risk of cancer and promote comfort.

Actinic Cheilitis

Actinic Cheilitis is a degenerative condition of the lip caused by sunlight, with ultraviolet radiation being the specific factor. It predominantly affects the lower lip, which is exposed to more sunshine than the upper. The upper lip can also be affected, however, albeit to a considerably lesser degree.

The relationship between actinic cheilitis and squamous cell carcinoma of the lip has long been known.¹ Actinic cheilitis occurs most often and most severely in people of fair complexion with fair or red hair.² It is much more common in men, presumably because they are outdoors, on average, for much longer periods than women. Perhaps, the habitual use of lipstick by many women exerts a protective effect. People with heavy pigmentation are relatively immune to actinic damage, as melanin absorbs UV radiation. Actinic cheilitis is more common in outdoor workers and in people whose leisure activities keep them frequently outdoors, such as gardeners, sailors and golfers. The condition is uncommon, though far from rare, in people under the age of 40. Being progressive, it becomes more severe with increasing age.

Acute Actinic Cheilitis

Sunburn can occur on the lips at any age, again usually the lower, after prolonged sun exposure and usually involves the facial skin as well. It is an acute superficial in-

flammation, with blistering in severe cases, that resolves spontaneously in a few days or weeks at most. It may result in a longer-lasting persistent drying and scaling of the affected lip, but most cases appear to heal completely.

It is not known whether or not chronic actinic cheilitis is invariably preceded by acute episodes, but mild acute attacks are so common that the great majority of patients with the chronic form of the condition must have experienced them.

Chronic Actinic Cheilitis

Clinical features

In its early stages, Chronic actinic cheilitis is characterised by mild patchy hyperkeratosis of the vermilion interspersed with irregular areas of erythema. Persistent scaling and a feeling of dryness may be troublesome to the patient. In the healthy lip, there is a fairly sharp line of demarcation between the vermilion and the skin. With actinic cheilitis, this line becomes blurred and unobtrusive vertical striations develop perpendicular to the skin/vermilion border. The skin tissues immediately below the lip thicken, resulting in a loss of the normal concavity in this area. In time, this thickening becomes more pronounced, producing a horizontal ridge of firm soft tissue just below the vermilion (Figs. 1 and 2).

These changes all become more obvious with time. The hyperkeratosis thickens; the erythema



Fig. 1: Male, age 52. Outdoor worker (milkman). Fair hair and skin. Early actinic cheilitis showing patches of hyperkeratosis and of erythema, blurring of the skin/vermilion junction with the presence of wrinkles at right angles to the junction, and thickening of the skin just beneath the vermilion.



Fig. 2: Male, age 44. Outdoor worker. Red hair and fair skin. A more advanced case with more prominent skin ridging.

deepens in color; and small ulcers may form and be slow to heal. Wrinkling and puckering of the vermilion may develop. The vermilion/skin demarcation becomes even less distinct and the ridge of tissue below the vermilion more prominent (**Figs. 3 and 4**). Some patients experience a mild tingling or burning sensation.

Other conditions may produce similar symptoms, but should not be confused with actinic cheilitis. In lichen planus of the lip, for example, the hyperkeratosis is usually reticulated and lesions are present intra-orally. Discoid lupus erythematosus can also affect the lip, but again there are other lesions, usually on the skin of the face or head.

Microscopic Features

The earliest histological changes seen in the lip as a result of UV radiation occur in the subepithelial connective tissues. This degenerative change is known as solar elastosis, as its primary effect is believed to be a swelling and disintegration of the elastic fibres, resulting in the formation of masses of relatively acellular hematoxyphilic material in the lamina propria. This condition is also seen in the corium of chronically sun-damaged skin, and is invariably present beneath squamous carcinoma of the lip. It is believed to be an irreversible change. The abnormal material produced in solar elastosis may account for the thickened area of skin seen below the vermilion in individuals with actinic cheilitis.

Table I

Incidence Of Lip Carcinoma Per 1,000,000, Ages 0-85 Years, For 1989

	Male	Female
Canada	3.92	0.62
Alberta	0.49	1.13
British Columbia	1.94	0.10
Manitoba	5.17	1.25
New Brunswick	4.82	0.00
Newfoundland	14.34	0.66
Nova Scotia	3.93	0.37
Ontario	3.53	0.74
Prince Edward Island	11.81	0.00
Quebec	2.46	0.47
Saskatchewan	9.43	1.08

Data supplied by the Laboratory Centre for Disease Control, Health Canada.

The microscopic changes that occur in the epithelium during the early stages of actinic cheilitis are hyperkeratosis and atrophy, but with no dysplasia. In later stages, dysplasia is present to some degree, i.e. mild, moderate or severe, with all the histological features of disrupted epithelial maturation. The potential for frank squamous carcinoma to develop in dysplastic epithelium is known to be high.

Carcinoma Of the Lip

Table I shows the incidence of lip cancer in Canada, by province, in 1989 — the most recent year for which figures are available from

Health Canada. The actual incidence of lip cancer may actually be higher, as some lip cancers are treated in the private offices of dermatologists and surgeons and are therefore not included in the national statistics.

Of note is the high incidence of lip cancer in both Newfoundland and Prince Edward Island. In fact, the incidence of lip cancer in Newfoundland is the highest in the world.³ No satisfactory explanation has been advanced to account for this phenomenon. While the figure for Ontario is quite low — there were actually 221 lip cancers in men and 58 in women in Ontario

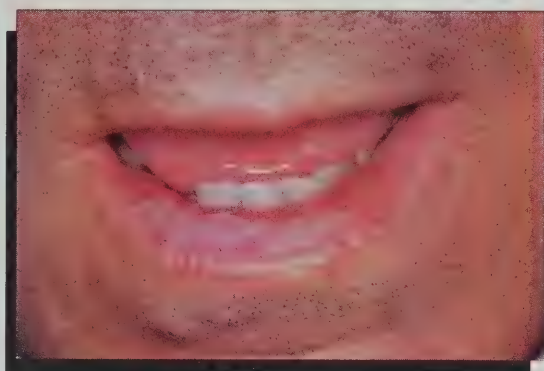


Fig. 3: Male, age 48. More extensive and thicker hyperkeratosis.



Fig. 4: Male, age 64. Farmer. Darkish skin. Mediterranean origin. Persistent ulceration with the other features of severe actinic cheilitis, but microscopically showing severe dysplasia with no neoplasia. Treated by a vermillionectomy.

in 1991 — again it is probably an underestimate.⁴

Lip cancer is predominantly squamous cell in type. Basal cell carcinomas occur occasionally just on the skin side of the skin/vermilion border, but seldom, if ever, on the vermilion. Basal cell carcinoma appears to be as common on the upper as the lower lip.

In virtually all cases, squamous cell carcinoma of the lip develops in pre-existent actinic cheilitis. There are no doubt exceptions to this rule, but they are very infrequent. It seems improbable that smoking clay pipes or holding the tarry string of fishing nets in the mouth, while repairing them, cause many lip cancers today, if they ever did. Lip cancer, therefore, is most commonly seen in individuals with the same characteristics as those described above, but it is uncommon in individuals under 50 years of age. It usually develops just on the vermilion side of the skin/vermilion junction, with over 90 per cent of this cancer occurring on the lower lip.

There are no clear cut features that allow early carcinoma to be distinguished clinically from actinic cheilitis. Changes that must be considered as indicators of possible malignant change include:

1. a localised raised indurated area.
2. a non-healing ulcer.
3. a persistent velvety area of erythema.
4. a raised localised patch of increased hyperkeratosis.

In lips affected by actinic cheilitis, various levels of dysplasia and early squamous carcinoma can be present simultaneously in different parts. Any of the changes listed above are indications for immediate biopsy.

Management Of Actinic Cheilitis

When actinic cheilitis is diagnosed, the first necessity is to explain the condition to the patient, emphasizing its slowly progressive nature and malignant potential. There are no reliable statistics on which to estimate the likelihood of neoplastic change, but this figure cannot be very high as actinic cheilitis has a much higher incidence than lip cancer. It is believed, however, that sun damage is cumulative, and that with continuing exposure the development of cancer is simply a matter of time. Hence, actinic cheilitis in younger persons is a good indicator of potential malignant change, and is therefore more important to recognize and treat.

Biopsy is not necessary in the early stages. However, it is indicated in more advanced stages to assess the degree of dysplasia present. The most severely damaged area should be selected. Biopsy is mandatory in all cases where there is clinical suspicion of malignant change.

Sun Screens

There is an extensive literature on the mechanisms of action and protective effects of sun screens

against ultraviolet radiation. UV radiation is scattered in the atmosphere and reaches the skin from all angles. Hats, sunshades, trees, etc., only reduce its intensity on the face, but do not obviate it. This is especially true on water, where strong reflections occur from all angles.

There are two major classes of sun screens, chemical absorbers of solar radiation, exemplified by para-amino benzoic acid (PABA), and physical reflectors such as zinc or titanium oxide. The latter are more effective protectors, but are not generally acceptable because of their appearance. PABA has been used in sun screening and sun tanning preparations for over 50 years. It has now generally been replaced by its esters, for example glyceryl PABA.⁵

The primary factors determining the effectiveness and duration of a sun-screening agent are the active ingredient and base. Sun screens are available as creams, liquid/gel preparations, and as waxy sticks. Payne⁶ found that liquid/gel based agents gave the longest lip protection. However, as subjects are unaware of the presence of this form of sun screen on their lips, they do not know when it needs replacement.

At present, the most practical and easiest to use types of sun screens are the wax-stick forms, sold as clear lipsticks, or the petrolatum-based forms, sold in tubes for squeezing directly onto the lips.

Sun screens are rated by a "Sun Protection Factor" (SPF) expressed



Fig. 5: Male, age 69. Mediterranean origin. Early micro-invasive squamous carcinoma. Treated by surgery.

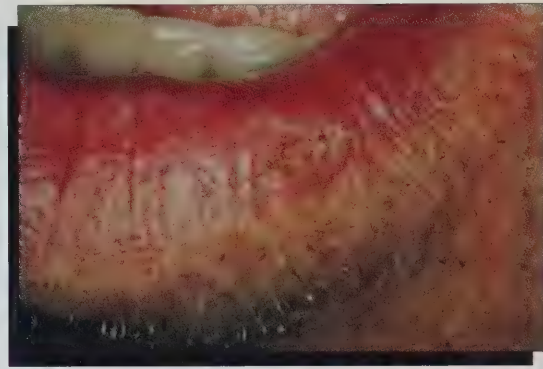


Fig. 6: Male, age 68. Mediterranean origin. Squamous cell carcinoma showing a small non healing ulcer with raised rolled hyperkeratotic margins. Treated by radiation at patient's request.

as a number. SPF is derived from the "minimal erythema dose" (MED) time of sun-screen protected skin divided by the MED time of unprotected skin. Somewhat crudely, this means using a sun screen of SPF 10 will result in the same degree of UV penetration to the skin in 10 hours as would be experienced in one hour with no sun screen.

Patients with actinic cheilitis should use sun screens with a high SPF of 15 or more. They should be strongly advised to carry sun screen with them at all times, to apply it to the lower lip whenever they go outdoors, and to reapply it frequently — at least once per hour.

Sailors should be advised to use a zinc or titanium oxide sun screen when on the water. (Readers may recall that Mr. Dennis Connor used this type of sun screen during the last America's Cup races.) Patients should be told that UV radiation is present all year round, in both sunshine and cloud cover conditions, and that sun screen should be used outdoors regardless of the climatic conditions.

Sun screens have not been shown to reverse dysplastic changes in the lip epithelium, and there is no statistical evidence showing that they reduce the incidence of lip neoplasia. However, they appear to be effective in clinical practice, apparently maintaining the patient's actinic cheilitis at the level it had reached before the habitual use of a lip screen was

begun. The senior author has followed many patients over many years whose actinic cheilitis has progressed minimally following the regular use of lip screen. The lip screens also produce a softer, less scaly and more comfortable lip, which is probably due to the base material as well as the active ingredient.

The effectiveness of sun screens in reducing UV penetration to the skin is not in doubt, and it seems reasonable to assume the same is true for lips.

Management of Carcinoma Of the Lip

The five year cure rate for lip carcinoma is high, over 90 per cent in many reported series.⁷ Surgery and radiation therapy are equally effective. Surgical treatment usually consists of a wedge resection of the tumor and excision of all the lower lip epithelium, a "vermillionectomy" or "lip shave."⁸ The latter is performed to remove all the dysplastic epithelium and minimize the chance of further tumor formation. Lip shaves are also done for cases of actinic cheilitis that show severe dysplasia or carcinoma *in situ* on biopsy. The excised vermilion is replaced by an advancement flap of mucosa, with good cosmetic results.

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The Dental Office Medical Emergency: What Do I Do?

E.R. Young, B.Sc., DDS, B.Sc.D., M.Sc., FADSA

Today, general dentists and dental specialists are treating older and more medically-compromised patients. At the same time, treatment is becoming more sophisticated and appointments are getting longer. This has increased the likelihood that dentists will experience a significant in-office medical emergency at some point in their career.

Life-threatening emergencies can happen to anyone in the dental office, be it the patient, a staff member, or the dentist. Because these types of emergencies occur only rarely — although non life-threatening emergencies may become life-threatening if intervention is not swift — a protocol must be designed that is not only logical but easily remembered. The actual implementation of such a protocol should be based on the premise that the practitioner can recognize an emergency situation. In addition, the office must be prepared to implement the protocol by having specific staff assignments in place and by conducting dress rehearsals for an emergency situation. Finally, the office must maintain an adequate and up-to-date emergency kit.

The emergency protocol that I have used and taught for many years is based on the American Heart Association (AHA)'s definition of the "Initiation of Stabilization" at the scene of the emergency event. I have made several modifications to this protocol to make it

Table I

Steps In the Initiation of A Stabilization Protocol

1. Call for HELP (911) — you will need several pairs of hands to follow this protocol.
2. Open and maintain the airway.
3. Assess the patient's breathing by look, listen and feel.
4. The patient who begins to breath spontaneously is given 100-percent oxygen.
5. The patient who does not begin to breath spontaneously receives mouth-to-mouth (or similar) ventilation.
6. Properly position the patient.
7. Assess the carotid pulse. If no pulse is present, administer CPR. If a pulse is present, assess its rate, rhythm, and volume.
8. Take and interpret the patient's blood pressure.
9. Administer simple drugs.
10. Set up an intravenous (the least important step).

more relevant to dental practice. The principals, however, are identical to those used in hospital operating rooms and emergency departments across Canada, and can indeed be applied to any emergency situation, anywhere.

The 10 steps in the Initiation of Stabilization are listed in **Table I**. These steps should be followed in any and every medically-related emergency. Dentists and staff members should resist the temptation to skip any of the steps!

Initiation of Stabilization

Without a doubt, the most important step in handling any medical emergency is to open the patient's airway. It should be noted that a conscious patient can almost always maintain his or her own airway, as he or she maintains upper airway muscle tone and protective airway reflexes (the ability to cough, swallow, and gag). However, the unconscious victim requires the help of a rescuer to maintain his or her airway, as mus-

cle tone (particularly of the genio-glossus and geniohyoid muscles) is lost early and pharyngeal and laryngeal structures (especially the tongue) collapse, occluding the upper airway. Of course, the protective airway reflexes are also lost with loss of consciousness.

The airway can be mechanically opened by positioning the victim's head and neck in the "early morning sniff" position, as described by Magill. Anatomically, this can be accomplished by flexion of the neck (cervical spine) and rotation of the head at the atlanto-occipital joint. This simple manoeuvre can be done by one of three methods:

- The rescuer's fingers are placed on the inferior border of the victim's mandible and the head is rotated until the chin faces toward the ceiling (Fig. 1)
- the head-tilt, neck-lift manoeuvre
- the head-tilt, chin-lift manoeuvre (Fig. 2)

Occasionally, the mechanical methods of opening the airway, which simply put traction on the structures of the tongue, larynx and pharynx, are insufficient to open the airway adequately. In this case, the patient may show persistent signs of upper airway obstruction (Table II). If these signs continue, the rescuer should initially attempt to reposition the airway as described above. Pieces of adjunctive equipment that may be of benefit include high-volume suction, tonsillar suction, Magill forceps, a mouth prop (Figs. 3 and 4) and oropharyngeal airways (Fig. 5).

Once the airway is open, the victim's breathing should be assessed by look, listen and feel. This assessment allows the rescuer to assess actual airway patency and the victim's ability to effectively move air. Three criteria must be met. Specifically, the rescuer must: see the abdomen and thorax rising together, hear quiet breath sounds, and actually feel breaths against their cheek.

When the airway has been opened and the victim's breathing assessed, there are three possibilities. The first is that the patient will begin to breath spontaneously. In

Table II

Signs Of Upper Airway Obstruction In the Unconscious Victim

- If obstruction is complete, there may be no signs. That is, the patient makes no attempts to breathe.
- If obstruction is partial, i.e. patient is attempting to breathe but no effective air movement is occurring, the signs may include:
 - high-pitched inspiratory "crowing" sounds: stridor
 - excessive snoring: sonorous sounds
 - gurgling: fluid, usually from passively-regurgitated stomach contents, in the airway
 - an initial tachycardia, which can proceed to cardiac arrest.
 - instead of the abdomen and thorax rising together on inspiration, the abdomen rises but the thorax descends
 - use of the accessory muscles of respiration in the neck
 - collapse of the suprasternal and supraclavicular spaces
 - cyanosis: a late sign!

Table III

Clinical Signs of Significant Hypotension Requiring Treatment

- Pallor
- Cold, clammy (moist) skin
- Perhaps cyanosis
- Altered mental state or even loss of consciousness
- Collapsed peripheral (e.g. hand) veins
- Delayed (4-5 seconds) capillary refill
 - This refers to the return of color following the release of pressure applied to the finger nail. Color should normally return within about two seconds.

this case, the airway should be maintained and oxygen delivered via a bag-valve-mask device (Figs. 6 and 7). If consciousness is regained, it is then rarely necessary to maintain the patient's airway, but oxygen administration should be continued. In the rare event that breathing does not spontaneously resume after opening the airway, artificial ventilation should be provided (usually mouth to mouth). Ideally, oxygen should be provided via a portable E-size cylinder, as many emergencies happen outside of the dental operatory (Fig. 8). This system, at a usual flow rate of seven litres per minute, is the only way of assuring the actual administration of 100-per-cent oxygen to the victim. It is important that the transparent reservoir bag is attached to the

bag-valve-mask device as shown in Fig. 6.

The carotid pulse should be evaluated next (usually for 10 seconds), while maintaining the airway. It is assumed that all office personnel are trained in basic cardio pulmonary resuscitation (CPR), including instruction in the correct evaluation of the carotid pulse. If there is no pulse, CPR must begin immediately. If there is a pulse, it should be further evaluated as to its rate, rhythm, (regular or irregular) and volume (full, medium, weak or thready). Similarly, the victim's blood pressure must be taken and evaluated. In most medical emergencies, blood pressure falls. Treatment is only required if blood pressure falls to a significantly low level. Significant hypo-

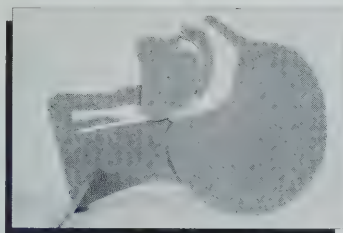


Fig. 1a: The airway is occluded by the tongue falling back against the posterior wall of the pharynx.

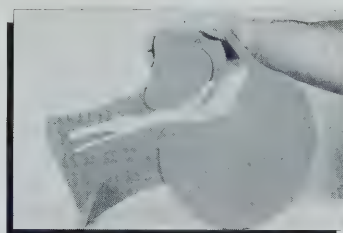


Fig. 1b: Opening the airway by rotating the head at the atlanto-occipital joint.



Fig. 2: The head-tilt, chin-lift manoeuvre is currently taught in CPR as the preferred method of opening the airway.

Table IV

Basic Drugs That Should Be Included In a Typical Dental Office Emergency Kit

Drugs	Indication	Comments
Vasoconstrictor, Bronchodilator:		
Epinephrine (1:1000 solution)	Anaphylaxis	0.3 - 0.5 mg subcutaneously or intramuscularly. Can be repeated if no improvement, or if condition is worsening
Anti-Histamine:		
Benadryl (diphenhydramine) Atarax (hydroxyzine)	Anaphylaxis/ Severe allergic reaction	50 mg intramuscularly after epinephrine
Steroid:		
Solu-Cortef (hydrocortisone)	Anaphylaxis	100 - 500 mg intramuscularly after epinephrine
Coronary and Arterial and Systemic Venodilator:		
Nitroglycerine	Angina	0.3 mg Sublingual tablets 0.4 mg Sublingual spray Up to three tablets or sprays over 10 minutes. If no relief of chest pain, assume myocardial infarction
Bronchodilator:		
Ventolin 100 ug/puff	Asthma	Best given via an (salbutamol) aerosol chamber Can be repeated, if unsuccessful Epinephrine 0.3 - 0.5 mg IM or subcutaneously is the recommended drug
Oral Carbohydrate		
(sugar)	Hypoglycemia	Orange juice (sweetened) plus sugar plus a viscous form of carbohydrate (corn syrup) sublingually

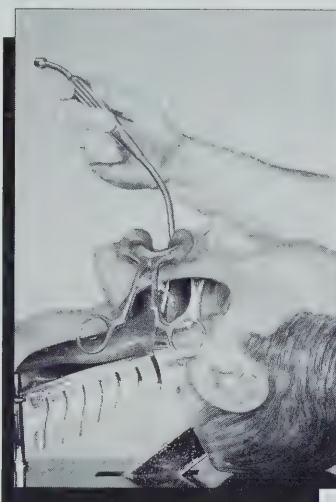


Fig. 3: Tonsillar suction to permit removal of liquid material deep in the upper airway. Its use is frequently facilitated by the use of a mouth prop.

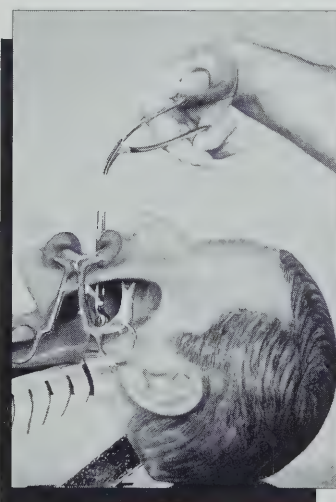


Fig. 4: Magill forceps to remove a foreign body, including solid material that is frequently passively regurgitated into the upper airway from the stomach.

tension has been classified by some as a fall in systolic blood pressure greater than 30 per cent of the victim's baseline reading. The victim's medical history and, especially, clinical signs are far more important in determining the actual significance of a fall in blood pressure, however. Table III lists the clinical signs of significant hypotension, all

of which indicate a situation in which intervention is necessary.

All medical emergencies require proper patient positioning. The standard practice in an emergency situation is to place the patient's upper body in a horizontal position with the legs elevated, permitting an actual autotransfusion of blood from the legs back to the central



Fig. 5a:

Figs. 5a and b: Proper insertion of an oropharyngeal airway in the unconscious victim.



Fig. 5b:

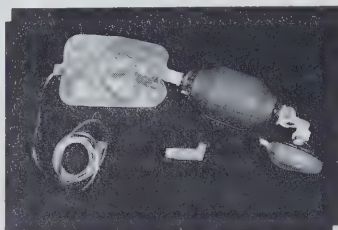


Fig. 6: A typical bag-valve-mask device to deliver 100-per-cent oxygen to the conscious or unconscious but spontaneously breathing victim.

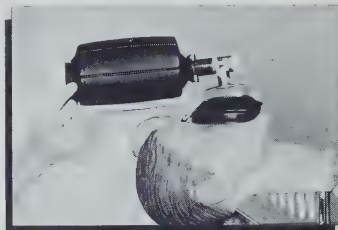


Fig. 7: Maintenance of the airway with the rotation of the head and a full face mask fitted over the mouth and nose. An oropharyngeal airway could be in place in the unconscious victim to help in airway maintenance. Some rescuers will use two hands to maintain the head tilt and mask fit simultaneously.

circulation. This position has been referred to as the modified Trendelenberg or modified "lawn chair" position. With the upper body flat, CPR can be initiated quickly, if required, and the elevation of the legs is the first-line treatment in cases of significant hypotension. Two exceptions to the use of the lawn chair position are acute respiratory (asthma) and cardiovascular (angina) emergencies where the patient is more comfortable in an unrestricted, semi-upright position (the Fowler position). Be sure to monitor the victim's blood pressure in the Fowler position, as the lack of venous return due to the non-elevation of the legs can contribute to significant hypotension. If this should occur, it can be treated quickly by simply elevating the legs.

While the basic steps outlined above are sufficient for the vast majority of emergencies in the dental office, there are several drugs that every dentist should keep in his or her emergency kit (**Table IV**). Without doubt, victims should always receive the most important drug — oxygen.

Unfortunately, it is beyond the scope of this brief article to review the in-depth pharmacology and dosage regimes for each of the drugs listed in **Table IV**. More infor-



Fig. 8: A bag-valve-mask device plus portable E-size cylinder of oxygen.

mation can be obtained by consulting a text such as the recent edition of Malamed's, *Medical Emergencies in the Dental Office*.

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TABLE 1

Body weight	Dosage in capsules of Rovamycine '250' (750,000 I.U. Spiramycin/capsule)
15 kg	3 capsules/day
20 kg	4 capsules/day
30 kg	6 capsules/day

absorption is not affected by food. In severe infections, the daily dosage may be increased by one half. In the treatment of beta-hemolytic streptococcal infections, adequate spiramycin dosage should be administered for 10 days. **SUPPLIED:** Rovamycine '250': Each orange and red capsule contains: 750,000 I.U. of spiramycin. Tartrazine-free. Bottles of 50. **Rovamycine '500':** Each grey and red capsule contains: 1,500,000 I.U. of spiramycin. Tartrazine-free. Bottles of 50.

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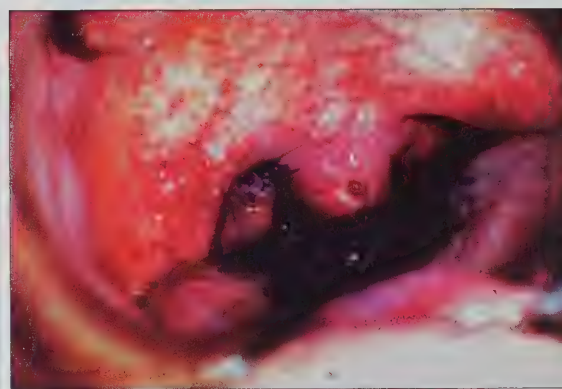
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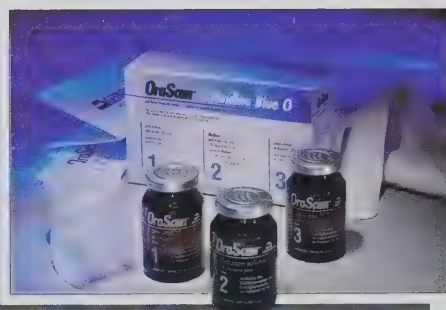
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OraScan Shows 100% Sensitivity for Oral Cancer in New Clinical Study

In a clinical study using OraScan, two British cancer experts have documented the diagnostic's extraordinary sensitivity. Newell Johnson, Nuffield Professor of Dental Sciences at the Royal College of Surgeons and Saman Warnakulasuriya, both of Kings College School of Medicine & Dentistry, used OraScan on 102 at risk patients in Sri Lanka and Pakistan where oral cancer is the #1 cause of cancer-related deaths. All subjects had potentially malignant lesions or conditions of the oral mucosa. Patients were first given a routine visual examination; then the OraScan rinse sequence was used and a second examination was conducted to look for stained lesions. The study found:

1) All 11 carcinomas observed by the experts were confirmed by the OraScan stain. "All clinically suspected carcinomas stained deep blue with excellent marginal demarcation. ...The OraScan kit recognises clinically apparent carcinomas with a

100% sensitivity... We conclude no false negative results were seen in carcinomas."

2) OraScan stained an additional 12 non-macroscopic (non-visible) lesions. Upon further examination, 5 of these demonstrated microscopic dysplasia [a likely pre-cancerous condition]. "The 5 dysplastic lesions solely detected by the dye test suggest that the OraScan kit is valuable for surveillance of the oral cavity in high risk subjects in addition to remarkable ability to have a high sensitivity in detection of invasive carcinomas."

The U.K. Working Group on Screening for Oral Cancer & Pre-Cancer Reports

Recognizing that "poor survival [among oral cancer victims] is due almost entirely to a failure to detect early lesions," a distinguished group of United Kingdom researchers, professors and specialists is preparing a national policy recommendation for the British government. In their interim report published June 1993, the Working Group notes:

Oral cancer mortality is "comparable to that of breast and invasive carcinoma of the uterine cervix in females, and greater than that of melanoma, to name three common cancers which attract much more media attention and public concern."

"Not only is there great variation in the clinical appearance of oral cancers — from classical indurated ulcers to erosive, speckled, white and verrucoid lesions — but whilst some may be preceded by a recognizable pre-invasive state it is thought that others arise against a background of clinically normal mucosa."

"Does detection of small lesions of oral cancer or precancer significantly improve the prognosis for any individual patient? The answer to this questions must be yes. ...Not only do smaller tumours have a better prognosis with regard to

increased chance of survival and prolonged survival time, but the smaller tumours are easier to remove with surgery alone. This will reduce morbidity which is inevitably associated with radiotherapy and recurrences."

"Where it is difficult to decide which is the most appropriate area for biopsy, in vivo staining may help... Staining with toluidine blue [OraScan] ... may stain the most suspicious areas and indicate these which need to be biopsied. Oral carcinoma in-situ and early invasive carcinoma have an affinity to retain toluidine blue dye."

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Call Germiphene Corporation (800-265-9931) for a supply of free brochures called "Oral Cancer — Are You at Risk?" Available in English and French, this informative piece helps patients understand the causes and implications of the disease, and prepares them for the OraScan test. The brochure provides an excellent focus for newspaper, radio and TV interviews. It can also be mailed to patients and distributed at community health programs.

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Two acknowledged Canadian oral cancer specialists, Dr. Joel Epstein, Division of Dentistry, British Columbia Cancer Agency and Dr. Benoit Lalonde, Specialist in Oral Medicine, University of Montreal have helped develop an educational video on oral cancer. While oral cancer is easy to treat when found early, the sobering truth is that 60% of oral cancer is advanced at the time of diagnosis. The videotape also demonstrates how OraScan, a new diagnostic, can identify pre-cancerous lesions and help in biopsy site selection.

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Postoperative Gastrointestinal Bleeding: A Case Report Involving a Non-Steroidal Anti-Inflammatory Drug

Kevin J. McCann, B.Sc., DDS, FRCD(C)

Jonathan Irish, MD, M.Sc., FRCS(C)

ABSTRACT

A case of serious gastrointestinal bleeding in the postoperative period is reported. A non-steroidal anti-inflammatory drug (NSAID) had been used for analgesia. This case highlights some of the potentially adverse effects of NSAIDs on the GI tract and the risk factors for such effects are discussed.

SOMMAIRE

Voici le cas d'une hémorragie digestive qui est survenue après une opération et pour laquelle on a eu recours à un anti-inflammatoire non stéroïdien (AINS) comme analgésique. On indique les effets contraires que peuvent avoir les AINS sur le tract gastro-intestinal et on commente les risques associés à ces effets.

Introduction

Analgesia in the postoperative period is most often achieved using opiates or their derivatives. These drugs have a number of side effects, including constipation, nausea and vomiting, orthostatic hypotension, respiratory depression and somnolence, which can serve to limit their desirability. The non-steroidal anti-inflammatory drugs (NSAIDs) act both centrally and peripherally, but it is believed that the latter action is most important in the production of analgesia.¹

NSAIDs have been found to compare favorably to some narcotics in the control of postoperative pain.² Ketorolac tromethamine is a recently introduced NSAID that is available for both intramuscular and oral use. Initial studies have indicated that, following orthopedic or abdominal surgery, the effect of intramuscular ketorolac is similar to that of morphine sulphate.^{3,4} Gillies et al⁵ indicated that patients who were receiving continuous infusions of ketorolac required significantly less morphine following abdominal surgery.

NSAIDs are not free of side effects, however. This report describes serious gastrointestinal bleeding in the postoperative pe-

riod with the use of ketorolac for analgesia. The pathophysiology and epidemiology of NSAID-induced gastropathy are also discussed.

Case Report

A 70-year-old female was referred to the Head and Neck Surgery Service of The Toronto Hospital for treatment of a left-sided tongue lesion. She reported traumatizing the tongue approximately two months prior to admission. Conservative treatment methods, including antibiotics, were unsuccessful. An incisional biopsy was returned as invasive squamous cell carcinoma.

The patient's medical history was significant for alcoholic cirrhosis, bronchitis, non-insulin dependent diabetes and benign breast disease. Fifteen years prior to her admission, she was hospitalized for rapidly declining liver function. She developed hepatorenal syndrome secondary to alcoholic hepatitis, alcoholic cirrhosis and hepatic precoma. Esophageal varices were noted at this time, but remained asymptomatic. Treatment consisted of high-dose corticosteroids and protein restriction. The patient was eventually discharged with stable liver function.

On her recent admission, the patient denied further use of alcohol since her bout of hepatitis. There was a four-year history of bronchitis secondary to her 50 pack a year tobacco use. Her diabetes had been present for over 15 years and was adequately controlled with dietary measures. Results of the remainder of her review of systems were within normal limits. Current medications included salbutamol inhalers for wheezing, as required, and lorazepam 0.5 mg for sleep, also as required. There were no drug allergies or hypersensitivity to ASA or other NSAIDs. She related no history of gastric distress associated with the occasional use of ASA.

Physical examination revealed a 5.0 cm indurated and ulcerated lesion on the left lateral border of the tongue extending into the floor of the mouth. The lesion did not cross the midline or extend onto the lingual alveolar mucosa. A supraclavicular node could be palpated on the ipsilateral side. Results of the patient's cardiovascular examination were within normal limits. Her respiratory exam was clear, except for expiratory wheezes over the lung bases. The liver edge was nodular and palpable 2.0 cm below the costophrenic angle. There was no other abdominal organomegaly. Results of musculoskeletal, peripheral vascular and neurologic examinations were all within normal limits. There was no evidence of jaundice, spider angiomas, ascites, clubbing or palmar erythema.

Investigations carried out following admission included a chest X-ray, head and neck CT and MRI scans, abdominal ultrasound and bone scan. The patient's chest film was significant in that it revealed a 1.4 cm mass in the right upper lobe. This mass was further defined with a thoracic CT scan and needle biopsy. The biopsy report indicated a small cell carcinoma. Abdominal ultrasound was consistent with cirrhosis, although liver metastases could not be ruled out. Results of the patient's bone scan were within normal limits. Liver function tests, serum electrolytes, albumin, total serum protein and coagulation in-

dices were also within normal limits. Both the CT and MRI scans defined the margins of the lesions and indicated that there was no apparent invasion of the mandible. The patient's tumor was staged as T₁N₁M₀.

The appropriate surgical management of the patient was reviewed with the hospital's tumor board. Her tongue carcinoma was believed to be the most immediate threat. It would be treated surgically, initially, followed by medical or surgical management of her pulmonary carcinoma. Due to the patient's history of hepatic coma, a hepatology consult was ordered. It appeared that her hepatic disease was well compensated, but lactulose was administered preoperatively to minimize hepatic encephalopathy.

The patient was brought to the operating room and underwent a tracheostomy, left modified radical neck and right supraomohyoid neck dissection, a mandibulotomy with a left floor of mouth dissection and partial glossectomy. The soft tissue defect was restored with a radial forearm free flap, and mandibular continuity was restored with a reconstruction plate. Estimated blood loss was 1,000 cc and urine output was 2,500 cc. She received 9,000 cc of crystalloid and four units of packed red blood cells, intraoperatively. Both the procedure and anesthesia were well tolerated, except for a bout of systolic hypertension at the conclu-

sion of the procedure. This was managed with nifedipine.

The patient's initial postoperative course was unremarkable. Postoperative analgesia consisted of ketorolac 30 mg IM every four to six hours (total dose not to exceed 120 mg/day), with morphine sulphate 5.0 to 7.5 mg IM every four hours for breakthrough pain. Minimal narcotic requirements were noted. The patient began nasogastric feeds on the third postoperative day, which were well tolerated until the following day. At this time she vomited a small amount of brown liquid, but responded well to cessation of feeding. Feeds were restarted the following day, but at smaller volumes, and were well tolerated. Additionally, the patient's lactulose was restarted, and an H₂ receptor antagonist (Famotidine) was started prophylactically. By the sixth postoperative day, she was started on ketorolac 10 mg every four to six hours by mouth. The total daily dose was not to exceed 120 mg IM or four tablets orally.

On the eleventh postoperative day, the patient complained of black stools. A rectal exam revealed the presence of dark brown stools with no obvious melena or bright red blood. A test for occult blood was not performed. A routine CBC indicated a hemoglobin of 115 g/L. Fig. 1 provides a graphic depiction of the changes in her hemoglobin and white cell count.

On the thirteenth postoperative day, a routine CBC analysis indi-

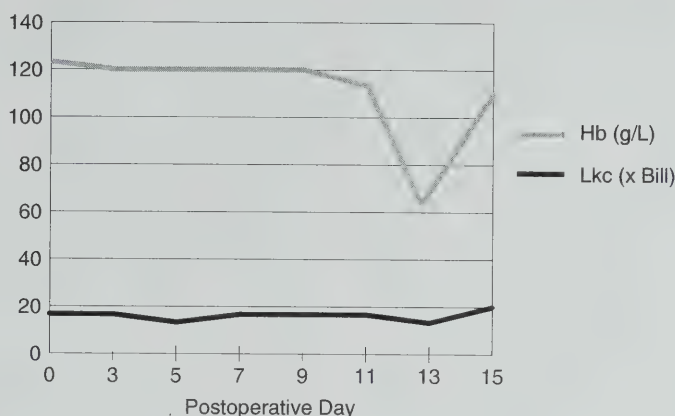


Fig. 1: Hemoglobin (Hb) and white cell counts (Lkc) noted postoperatively.

cated a hemoglobin of 63 g/L. The patient's blood pressure was 120/70 with no postural drop, and her pulse was 90. There was no evidence of active bleeding from any of her wound sites, and there had been no history of hematemesis. Both her conjunctiva and palms were pale, and the oral mucous membranes were dry. Results of cardiovascular and respiratory examinations were unchanged from admission. The patient's abdomen was soft and non-tender to palpation. The liver edge was unchanged from admission, and there was no further organomegaly. A rectal examination revealed the presence of melena stools that were positive for occult blood. The patient was then fluid resuscitated and transfused with four units of packed red blood cells. Gastroscopy was undertaken and indicated that the esophagus was normal throughout its length. There was a large pool of black fluid in the stomach. Once it was aspirated, a 3.0 x 2.0 cm ulcer was found on the lesser curvature in the body region. It had rolled, irregular edges, and was noted to be bleeding at the rate of one drop every two seconds. A second ulcer, approximately 3.0 x 1.0 cm, which had a similar appearance but was not actively bleeding, was noted in the prepyloric region. Finally, a third ulcer measuring 0.25 x 2.0 cm was noted in the duodenal cap. No active bleeding was noted from this ulcer. The gastric ulcer was sclerosed with 6.0 cc of three-percent saline with 1:10,000 epinephrine. At this time, the differential diagnosis was of stress-induced or NSAID-induced gastric and duodenal ulceration.

Treatment consisted of an H₂ receptor antagonist and sucralfate. The patient subsequently underwent esophagogastroduodenoscopy (EGD), further demonstrating the three previously-noted ulcers, all of which appeared to be healing. There was no evidence of esophageal varices, but there was a degree of erosive esophagitis that was believed to be secondary to a hiatus hernia. The ulcers were biopsied and found not to display any malignant changes. At this

time, the patient's H₂ receptor antagonist and sucralfate were discontinued, and she was placed on omeprazole. Hemoglobin and fluid status remained stable over the following five days. The patient was eventually discharged home on omeprazole, and continues to progress well following a right lobectomy. Her pulmonary surgery was well tolerated with no episodes of gastric bleeding. At one year postoperatively, there is no evidence of recurrence of either gastrointestinal bleeding or oral cancer.

Discussion

The clinical presentation of melena and blood in the gastric contents suggests a bleeding site that is proximal to the ligament of Treitz. Common causes of upper gastrointestinal bleeding include: peptic or duodenal ulcers, stress ulcerations, erosive gastritis, esophageal and gastric varices, esophagitis, Mallory Weiss tears and malignancies.⁶ On the basis of the clinical presentation, a Mallory Weiss tear was ruled out immediately. Gastroscopy was helpful in ruling out a variceal bleed. The EGD that was carried out after the patient was stabilized indicated that there was a degree of erosive esophagitis secondary to a hiatus hernia, but it did not appear to be the source of her bleed. Biopsies were eventually obtained that ruled out metastatic disease, which was a concern in this situation. Acute erosive gastritis will most often present as abdominal pain, nausea, vomiting and hematemesis. The differential diagnosis was thus shortened to include peptic or duodenal ulceration or stress ulcers.

Stress ulcer is a term that is often abused.⁷ It should be confined to acute gastroduodenal ulcers that occur secondary to shock and sepsis following operations, trauma or burns. The defects tend to be circular and small, usually less than 1.0 cm. Both the stomach and/or duodenum may be involved. The margins tend to be poorly defined and usually do not display hyperemic margins.⁸ In this situation, the patient had recently undergone a 12-hour ablative and reconstructive

procedure. Her overall physical condition was not optimal. While the morphologic appearance of the ulcers are not consistent with stress ulceration, they cannot be ruled out entirely.

The location of the gastric lesions are suggestive of NSAID-induced gastropathy. Roth^{9,10} has differentiated the patterns of NSAID-induced and classic peptic ulceration. NSAID gastropathy is usually located in the antrum and prepyloric region and is often seen in older females. There is a strong association with the use of NSAIDs for control of arthritis and the occurrence of gastropathy. It responds well to the use of cytoprotectants. Classic peptic ulcer disease is usually noted in the duodenum and is of unknown etiology. Men are the most common victims, and the disease responds well to acid suppression.

The etiology of NSAID-induced gastropathy, while not completely understood, is felt to be a disruption of the normal gastric mucosal barrier.¹¹ All NSAIDs block the action of the enzyme cyclo-oxygenase, which is required in the formation of the prostaglandins, thromboxanes and prostacyclins.¹² Inhibition of gastric prostaglandin production, specifically PGE₂, is felt to be a major mechanism in the induction of mucosal damage by NSAIDs.⁹ In addition, all NSAIDs are weak organic acids and may, therefore, be directly toxic to the gastric mucosa following ingestion.¹³ Direct toxicity is not a necessary condition, since it has been shown that rectally administered NSAIDs can induce gastric ulceration.¹⁴

Gastrointestinal complications are most often associated with the long-term use of NSAIDs. Fries et al¹⁵ have investigated the epidemiology of NSAID-induced gastropathy in arthritic patients. A series of 2,400 patients were followed up for 3.5 years. Risk factors that influenced gastrointestinal complications included advancing age, disease duration, degree of disability, smoking, previous NSAID intolerance, use of corticosteroids, use of antacids, and the use of H₂ receptor antagonists. Most



patients in the study had been taking NSAIDs for prolonged periods of time. Patients on NSAIDs were found to have a hazard ratio of 6.45 times that of patients not on NSAIDs. Gabriel et al¹⁶ reported similar findings in NSAID users. They stated that patients using NSAIDs had a three-fold greater risk of developing serious adverse GI complications. The risk factors in Gabriel et al's study included age greater than 60 years, previous history of gastrointestinal events and concomitant corticosteroid use. Additionally, there was a possible increased risk during the first three months of therapy.

There is increasing evidence to suggest that chronic NSAID use is associated with significant gastric mucosal injury that may result in hospitalization or death.¹⁷ The risk of short-term NSAID use in producing ulceration was investigated by Lanza et al.¹⁸ Invasive gastric antral ulceration was evident in 80 per cent of patients receiving ketorolac 90 mg IM four times daily for five days. There was a dose-related response in the mucosal damage. However, the use of a clinically effective dose (10-30 mg PO) was associated with less damage than 650 mg of ASA four times daily. While some investigators believe that the short-term use of ketorolac is relatively benign,¹⁹ serious gastric ulceration has been reported in this setting.²⁰ Due to such reports, the Canadian Adverse Drug Reaction Newsletter²¹ drew attention to the increased risk of adverse effects on the GI tract, especially in patients with a history of GI bleeding, the elderly and the debilitate patient.

While it is difficult to state with certainty that the cause of the gastric bleeding in this case was entirely due to the short-term use of ketorolac, there are several factors that strongly suggest a causal relationship. The location of the lesions, the temporal relationship to the use of an NSAID and the response of the ulcers to cessation of the drug and the institution of a cytoprotectant therapy are factors that support NSAID-induced gastropathy. It is impossible to rule out stress-induced ulceration. An alternative explanation could include

both causes, that is, both surgical stress and the postoperative use of an NSAID gave rise to an upper GI bleed.

It is important to consider the possibility of severe gastrointestinal complications if one chooses to manage short-term pain with ketorolac. In this clinical situation, a non-constipating analgesic was desirable due to the potential risk for hepatic encephalopathy. However, this patient did present with some risk factors for NSAID-induced gastropathy, namely advanced age and severe debility. If risk factors are present, the concurrent use of a cytoprotectant such as sucralfate or synthetic PGE₁ analogue (Misoprostol) may reduce the incidence of untoward GI complications.¹⁴ Alternatively, the centrally acting agents can be used.

Conclusions

NSAIDs have a long history of efficacy in the management of pain, fever and inflammation. They remain, however, one of the most important causes of adverse GI events.²² NSAID-induced gastropathy is considered to be multifactorial in nature, with a number of risk factors that contribute to morbidity and mortality. The documented risk factors include age greater than 60 years, previous history of gastrointestinal events and concomitant steroid use. There is also some data to demonstrate a greater risk with the short-term use of NSAIDs. Prophylaxis against NSAID-induced ulceration can be achieved with prostaglandin analogues; however, their indiscriminate use is not supported. The best defence is an awareness of the potential for gastropathy and avoidance of all NSAIDs in the high-risk patient, especially when a safer alternative exists. While the initial reports on the analgesic effectiveness of ketorolac are favorable, one must not lose sight of the fact that it is an NSAID, and therefore capable of causing serious gastrointestinal complications.

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Reprint requests to **Dr. Irish**.

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Vol. 60
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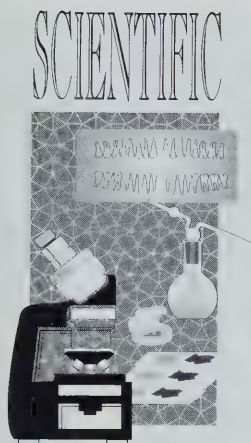
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Preventive Oral Health Behaviors In a Multi-cultural Population: The North York Oral Health Promotion Survey

Barbara J. Payne, M.Sc.

David Locker, BDS, PhD

ABSTRACT

To examine the preventive oral health behavior levels of randomly-selected dentate and edentulous adults, age 18 and over, a mail survey was conducted in North York, Ontario, a multicultural suburb of Metropolitan Toronto ($n = 1,050$). High optimal levels of at least daily tooth brushing were reported by the majority of the dentate (96 per cent). Lower rates were evident for yearly preventive visiting (69 per cent), daily flossing (22 per cent), daily use of an interdental device (25 per cent), not snacking between meals (12 per cent) and eating one or no cariogenic foods on the previous day (36 per cent). Logistic regression results indicated higher levels on an additive index of oral preventive behaviors for females, those having a higher education and non-Italian respondents. Edentulous respondents reported high daily denture cleaning rates (87 per cent), but less frequent night removal (51 per cent), checking for oral lesions (68 per cent) and preventive visiting (12 per cent). Oral disease is one of the most common and costly chronic disorders affecting modern populations. However, unlike most other chronic diseases, it is largely preventable. These data in-

dicating a clear need for determined oral health promotion efforts to inform and encourage increased levels of preventive behaviors in addition to tooth and denture brushing, particularly among specific socio-demographic and ethnic groups.

Key Words: oral hygiene, dentate, edentulous, health promotion.

SOMMAIRE

Afin d'étudier les habitudes préventives que les 18 ans et plus, tant dentés qu'édentés, appliquent en hygiène bucco-dentaire, on a posté un questionnaire à des personnes choisies au hasard et habitant à North York, une banlieue de la région métropolitaine de Toronto où vivent des gens de différentes cultures ($n = 1\ 050$).

La majorité des dentés (96 p. cent) se brossent les dents tous les jours, 69 p. cent visitent le dentiste chaque année pour un examen de prévention, 22 p. cent utilisent la soie dentaire, 25 p. cent utilisent chaque jour un instrument interdental, 12 p. cent ne mangent rien entre les repas, et 36 p. cent avait consommé la veille un seul aliment cariogène ou aucun. Sur un indice additif, la régression logistique indiquait de meilleures habitudes d'hygiène chez les

femmes, les personnes instruites et les répondants non-italiens.

Parmi les édentés, 87 p. cent nettoient quotidiennement leurs prothèses, 51 p. cent les retirent pour dormir, 68 p. cent visitent le dentiste pour voir s'ils ont des lésions buccales et 12 p. cent le visitent par mesure de prévention.

Aujourd'hui, les maladies dentaires sont les désordres chroniques les plus communs et les plus coûteux. Cependant, contrairement à la plupart des autres maladies chroniques, on peut en prévenir la plupart. Aussi les données recueillies indiquent-elles clairement que, dans le domaine de la prévention en santé bucco-dentaire, des efforts concertés sont nécessaires pour informer les gens, en particulier certains groupes ethniques et socio-démographiques, et pour les encourager à adopter de meilleures règles d'hygiène en plus du brossage des dents ou du nettoyage des prothèses.

Mots clés: oral hygiene, dentate, edentulous, health promotion.



Introduction

Dental caries and periodontal disease are among the most common chronic disorders affecting modern populations. While rarely life threatening, they can be a significant source of disability and handicap.¹ Moreover, according to Health Canada estimates, in Canada, the private and public resources used to treat these diseases and their sequelae rose from \$1.3 billion to \$3.1 billion per annum during the 1980s. The size of these expenditures was exceeded only by the costs related to cardiovascular diseases and mental disorders.² Yet dental caries and periodontal disease can largely be prevented by a combination of self-care, professional intervention and adequate fluoride intake.

Self-care is a key component of the health promotion approach. Dental health care providers have historically taken a leading role in the promotion of positive preventive oral behaviors such as oral hygiene and nutrition. National studies that examine oral health behaviors in adult populations have consistently reported rates exceeding 90 per cent for daily tooth brushing,³⁻⁵ but much lower rates for daily flossing (three per cent, nine per cent, 12 per cent, 18 per cent),⁵⁻⁸ daily use of an interdental cleaning device (30 per cent, 25 per cent),^{5,6} and annual dental examinations (at least 60 per cent).^{3,6-10} Studies of specific populations report rates similar to the national average for tooth brushing and annual visitation, while flossing rates in these populations tend to be higher. For example, a recent study of housing unit residents in the Detroit, Michigan, tricity area found rates of 96 per cent, 73 per cent and 32 per cent for brushing, visitation and flossing, respectively.¹¹ Rates for persons 50 years of age and over residing in community dwellings in Ontario were 96 per cent (brushing), 67 per cent (visitation) and 21 per cent (flossing).¹²

Studies examining how socio-demographic differences affect the practise of oral preventive behaviors have routinely found that women^{3,4,6,7,9,11,12} and those with more education^{3,6,11} and in-

Table 1

Selected Characteristics of Target Population and Study Respondents (%)

	Target Population (n = 432,500)	Study Respondents (n = 1,050)
Age		
18 to 19	— ¹	1.5
20 to 24	11.0	8.3
25 to 44	42.3	38.9
45 to 64	28.7	29.6
65 and over	18.1	21.7
Gender		
Female	52.3	58.2
Male	47.1	41.8
Place of Birth²		
Canada	52.3	55.6
Outside Canada	47.7	44.4
Mother Tongue^{2,3}		
English or French	63.8	62.4
Chinese	5.7	3.0
Italian	10.6	10.7
Other	19.9	23.9
Ethnic/Racial Origin⁴		
Canadian	not included	18.8
British	27.4	6.5
Italian	15.4	12.5
Jewish	10.6	8.8
Visible minorities	15.3	10.8
Multiple origins and other	31.3	42.6

¹Not available. 1991 Canadian census data reported in five year age intervals only.

²1986 census data.

³Defined as the first language learned in childhood and still understood at the time of reporting.

⁴Defined as one's roots or ancestral origin.

come^{3,4,6,11,13,14} report higher levels of self-care practices. The influence of age on oral hygiene practices has not been consistent and, when significant, the effect has been weak.^{3,4,6} Findings for ethnic and racial differences vary, with some United States' studies reporting lower visitation rates for minority groups^{9,11} in comparison to Caucasian groups, although similar¹¹ or higher¹⁵ brushing and flossing rates.

Some Canadian data on preventive oral health behaviors are available. They tend, however, to be

somewhat limited by targeting younger children^{16,17} or older age groups,^{12,18} or by examining a narrow range of behaviors. For example, Canada's 1990 Health Promotion Survey collected data on tooth brushing and visitation only.³ Other health surveys with a dental component, such as the Ontario Health Survey,¹⁹ the Canada Health Survey²⁰ and the General Social Survey,²¹ only collected information on annual visitation. Data for practices beyond tooth brushing and visitation for adults

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and, in particular, for the edentulous, are lacking. In addition, the multicultural diversity of the Canadian population has not been addressed, although it has been found that membership in an ethnic, racial or cultural group can influence a variety of health outcomes and behaviors.^{9,11,15,22,23} Consequently, data identifying at-risk groups of adults to which educational and health promotion programs could be targeted are not available. In this paper, we report the results of The North York Oral Health Promotion Survey, which examined the oral health behaviors of a multicultural population of adult respondents aged 18 and over.

The Oral Health Promotion Survey formed part of the research program of the Community Dental Health Services Research Unit (CDHSRU), a joint project of the department of community dentistry, faculty of dentistry, University of Toronto, and the dental division of the North York Public Health Department. The unit was funded under the terms of the Health Systems Linked Research Unit program of the Ontario Ministry of Health. Its mandate is to produce data to assist in the planning and monitoring of community dental health services for the population of North York and the wider population of Ontario. The study reported in this paper is the first of a series focusing on oral health promotion.

North York, a community of 563,270 people, is a highly diverse suburb of Metropolitan Toronto. In 1986, more than two-fifths of its population (44.6 per cent) were born outside of Canada and more than one in three residents identified a mother tongue other than English or French. Over 80 ethnic or racial groups are represented in North York, with the British (27.4 per cent), Italian (15.4 per cent), Jewish (10.6 per cent) and Chinese (6.8 per cent) forming the four largest groups. A large proportion of Metropolitan Toronto's visible minority groups, including Black, Indo-Pakistanis and Korean populations, live in the community.²⁴ This highly diverse population presents a unique opportunity to examine variations in oral health

Table II
Sociodemographic and Other Characteristics of Study Subjects (%)

	All (N=1,050)
Married/common-law	62.6
Live alone	13.1
Paid employment	58.0
Income < \$20,000	16.3
Higher education	63.1
Born in Canada	52.3
Dental health rated fair/poor	23.5
General health rated fair/poor	12.5
Dentate	92.0
Problem chewing	12.3
Oral pain in last 4 weeks	37.4
Perceive need for dental care	34.1
Dental visit in last year	72.9
No dental insurance coverage	37.1

practices according to ethnic and racial diversity and to assess response patterns in a multicultural community.

The purposes of this study were twofold: 1) to examine the oral health behaviors of a population of adults (respondents were 18 years of age and over) by age, gender and ethnic/racial origin; and 2) to assess response rates and response patterns in a multi-cultural community. Response rates to the self-complete portion of the recent Ontario Health Survey (OHS) by North York residents indicate notable variations from the rates recorded by the majority of Ontario Public Health Units. Whereas the overall response rate for the OHS self-complete questionnaire was high (77 per cent), the response rate for North York (58 per cent) was the lowest of all Ontario Public Health Units.²⁵

Methods

Data were collected through a mail survey. The target population consisted of all persons aged 18 and over living in private households in the City of North York. The

sampling frame for the study was a voting list of 376,569 names compiled in the fall of 1991. Using polling subdivisions as primary sampling units, a two-stage random sampling procedure was employed to produce a list of 2,070 named respondents who were sent self-complete questionnaires in April 1992. The survey largely followed the procedures recommended by Dillman, commonly known as the "total design method."²⁶ Each potential respondent was sent a covering letter, a questionnaire and a stamped, addressed return envelope. Two weeks later, non-responders were sent a reminder postcard. If no response was received after four weeks, they were sent another covering letter, questionnaire and return envelope.

The questionnaire was designed to collect information on the preventive oral health practices of both dentate and edentulous respondents. Common problems experienced with self-complete mail surveys include memory failure and social desirability, where respondents choose the option most

Table III

Preventive Oral Health Behaviors by Gender and Age (%): Dentate Only

	All n ¹ = 976	Males 403	Females 560	p	18-44 495	45-64 288	65 & over 165	p
Preventive Visiting:								
Within the last year	69.4	67.4	70.8	n.s.	70.3	74.6	58.9	**
Longer than one year	30.6	32.6	29.2		29.7	25.4	41.1	
Toothbrushing:								
Few times/week or less	3.7	6.5	1.6		4.3	1.4	6.7	
Once per day	31.4	40.1	25.5	***	30.2	32.9	34.1	*
Twice or more per day	64.9	53.4	72.8		65.5	65.7	59.1	
Flossing:								
Never	33.2	42.4	26.6		26.5	35.0	51.2	
Few times/week or less	44.5	41.6	46.6	***	53.8	38.5	28.4	***
Once or more per day	22.3	16.0	26.8		19.8	26.5	20.4	
Use Interdental Device:								
Never	34.0	30.4	36.4		42.4	23.9	24.8	
Few times/week or less	41.1	43.7	39.3	n.s.	46.0	37.7	31.7	***
Once or more per day	24.9	25.9	24.3		11.6	38.4	43.5	
Fluoride or Antiplaque:								
Use fluoride mouthwash	26.2	24.2	27.8	n.s.	26.8	25.6	25.2	n.s.
Use antiplaque mouthwash	26.1	23.9	27.9	n.s.	24.6	27.2	27.2	n.s.
Between Meal Snacking:								
Rarely or never	11.7	12.0	15.6		16.1	14.8	6.7	
Occasionally	27.6	23.0	26.0		27.3	25.0	16.5	
About once a day	22.1	23.0	21.3	n.s.	21.8	20.8	25.6	**
Twice or more a day	38.7	42.0	37.0		34.7	39.4	51.3	
Number of cariogenic foods previous day:								
None	11.0	8.8	12.8		10.8	10.5	14.1	
One	26.3	22.3	28.6	**	25.6	27.5	22.2	n.s.
Two or more	62.7	68.9	58.6		63.7	62.0	63.7	

¹N's may vary due to missing cases.

*p < .05; **p < .01; ***p < .00001

favorable to their own self-esteem or closest to their appraisal of current social norms.²⁷ Specific steps were taken in the design of the oral hygiene questions to minimize under- or over-reporting of behaviors. Rather than a "yes/no" format, the response categories for oral hygiene behaviors were relatively close in their social desirability value. Respondents were asked to choose from seven response categories ranging from "never" to "twice or more a day." Despite this

precaution, respondents may have "remembered" in their own favor, thus over-reporting their actual performance. Preventive oral health behaviors were analyzed separately for the dentate and edentulous using chi square analysis. Results are reported for the dentate according to age, gender and ethnic origin. Ethnic origin was determined by the response to the question: "What is your ethnic or cultural identity? Circle all that apply." The six most frequently oc-

curing single responses for ethnic/racial origin group were selected for analysis and include: Canadian, British, Italian, Jewish, visible minorities and other. "Visible minorities" is a designation used by Statistics Canada's Employment Equity Program to include people, other than aboriginals, who are non-white or non-Caucasian.²⁴ In this study, it includes all respondents indicating Caribbean, Chinese, Black, Hispanic, East Indian or Vietnamese origins. The "other"

Table IV

Preventive Oral Health Behaviors by Ethnic/Racial Origin(%): Dentate Only

	Canadian n ¹ = 175	British 60	Italian 121	Jewish 86	Vis. Minorities 113	Other ² 396	p
Preventive Visiting:							
Within past year	73.1	75.0	38.8	72.1	58.4	72.0	*
Longer than one year	26.9	25.0	61.2	27.9	41.6	28.0	
Toothbrushing:							
Few times/week or less	4.0	1.7	11.6	2.3	0.0	3.1	
Once per day	28.3	23.3	50.4	36.0	22.3	30.2	***
Twice or more per day	67.6	75.0	38.0	61.6	77.7	66.8	
Flossing:							
Never	28.2	37.3	43.8	32.9	28.8	32.6	
Few times/week or less	50.6	42.4	40.5	40.0	36.0	47.3	**
Once or more per day	21.3	20.3	15.7	27.1	35.1	20.1	
Use Interdental Device:							
Never	40.2	40.7	27.3	24.7	32.1	35.1	
Few times/week or less	41.4	33.9	44.6	35.3	41.1	41.8	*
Once or more per day	18.4	25.4	28.1	40.0	26.8	23.1	
Fluoride or Antiplaque:							
Use fluoride mouthwash	22.3	23.4	33.3	19.7	25.0	28.1	n.s.
Use antiplaque mouthwash	21.0	29.6	31.3	23.8	24.3	27.8	n.s.
Between Meal Snacking:							
Rarely or never	9.7	15.3	16.5	8.2	10.8	10.5	
Occasionally	26.3	30.5	30.6	28.2	33.3	25.6	
About once a day	27.4	22.0	21.5	21.2	18.0	21.3	n.s.
Twice or more a day	36.6	32.2	31.4	42.3	37.8	42.6	
Number of cariogenic foods previous day:							
None	11.7	19.6	6.4	13.5	10.2	10.5	
One	27.6	29.4	21.8	27.0	22.4	26.2	n.s.
Two or more	60.7	51.0	71.8	59.5	67.3	63.4	

¹N's may vary due to missing cases. ²Includes all other ethnic groups and multiple responses.

*p < .05; **p < .01; ***p < .00001.

category includes all other ethnic/racial groups and those indicating multiple origins.

Optimal behaviors for subjects retaining natural teeth were defined as follows: visiting a dentist at least once per year for an examination; brushing at least once per day; flossing once or more per day; using an interdental cleaning device such as a wooden toothpick, special brush or rubber tip to clean spaces between the teeth at least once a day; no snacking between

meals, and consumption of fewer than two cariogenic foods on the previous day. Two dental behavior indices were constructed by counting the number of optimal behaviors per subject.⁶ An oral health behavior index included brushing, flossing, use of an interdental device and a preventive visit for an examination. An index of nutritional behavior combined amount of snacking between meals and number of cariogenic foods consumed in the previous day. In cre-

ating these indices, each of the component behaviors was given equal weight.

For edentulous subjects, data are reported by gender and age only, due to small numbers. Optimal behaviors were defined as: a visit for a dental examination in the previous two years; daily cleaning of dentures; removal of dentures at night; and oral self-examination at least once a month. Again, an additive index of optimal behaviors

Table V
Correlations (Pearson's *r*) Between Oral Health Behaviors

	Brush	Floss	Device	Visit	# Sweets	Snacks
Brushing	1.0000					
Flossing	.1979**	1.0000				
Interdental device	.0075	.1178**	1.000			
Preventive visit	.1318**	.1988**	.0105	1.000		
Number of sweets	.0501	.0632	.0370	.0527	1.000	
Snacking	.0070	.0396	.0418	-.0167	.0680	1.000

***p* = 0.001.

was constructed with equal weight given to each component.

Results

Response To the Survey

Of the 2,070 questionnaires mailed, 201 were returned by the post office as non-deliverable. Completed questionnaires were received from 1,050 (56 per cent) of the remaining 1,869 eligible respondents. A minority (five per cent) of eligible respondents refused to participate and 38.6 per cent did not respond. The 56 per cent response rate parallels the response rate to the self-complete component of the 1990 Ontario Health Survey (58 per cent) by North York respondents.²⁵

Characteristics Of Respondents

In **Table I**, the age, gender and ethnic/racial origin characteristics of the study respondents are compared to the characteristics of the target population. Younger respondents (aged 18 to 44) are slightly under represented, as are males, but the differences are small, especially for age. In terms of ethnic/racial origin, place of birth and mother tongue, the distributions of the respondents match those of the target population quite closely. The inclusion of a "Canadian" category for ethnic/racial origin in this study may account for the low proportion of British respondents. The over-representation of respondents claiming "other or multiple origins" probably reflects the high rates of immigration to North York since the 1986 census, which was

Table VI

Distribution of Number of Optimal Behaviors for Indices of Oral Health and Nutritional Behaviors: Dentate Only

Number	Index	
	Oral Health Behaviors %	Nutritional Behaviors %
None	1.5	66.0
One	21.0	30.3
Two	49.4	3.8
Three	20.8	—
Four	7.3	—

used to obtain the ethnic group statistics of the target population.

Selected socio-demographic, behavioral and health status characteristics of the respondents are reported in **Table II**. Overall, the majority of respondents were educated beyond the high school level and had incomes of more than \$20,000 per year. Almost all were dentate and few experienced problems with chewing. Over one-third reported experiencing at least one of five oral pain symptoms in the previous four weeks, i.e. toothache; pain in teeth from hot, cold or sweet foods/liquids; pain in the jaw joints; pain/discomfort from dentures; or sore or bleeding gums. Approximately one-third thought they were in need of dental advice or treatment at the time of the survey and the majority had visited a dentist in the previous year. About two-thirds were covered by at least some dental insurance.

Preventive Oral Health Behaviors: Dentate Only

Distributions for eight preventive behaviors, for all dentate re-

spondents (males and females) in three age groups (18-44, 45-64, 65 and over), are shown in **Table III**. Variations by ethnic/racial origin appear in **Table IV**.

Overall, optimal behaviors were reported by the majority for preventive visiting (69 per cent) and tooth brushing (96 per cent) only. Low optimal rates were found for flossing (22 per cent), use of an interdental device (25 per cent), snacking (12 per cent) and ingestion of cariogenic foods (37 per cent).

Women reported more favorable oral health behaviors than men on measures of brushing, flossing and number of cariogenic foods consumed. No significant gender differences were found for preventive visiting, use of an interdental device, using fluoride or anti-plaque mouthwashes, or between meal snacking. Younger age groups were most likely to report preventive visiting, more frequent brushing and flossing, and less frequent snacking between meals.

TABLE VII

Results Of Logistic Regression (Dentate Only)

Dependent Variable: Index of oral health behaviors (0,1 = 1; 2,3,4 = 0)					
Independent Variables	Beta	SE	p-value	OR	95% CI
Gender (Male = 1)	.4846	.1707	.0045	1.6	1.2 - 2.3
Age (65-98 = 1)	-.0121	.0054	.0247	1.0	1.0 - 1.3
Education (High school or less = 1)	.5105	.1839	.0055	1.7	1.2 - 2.4
Ethnic/racial group (Italian = 1)	.5802	.2283	.0111	1.8	1.1 - 2.8

Significant variation by ethnic/racial group was found (**Table IV**), with those indicating Italian origin being the least likely to report optimal levels of preventive visiting, tooth brushing and flossing. Canadians were the least likely to use an interdental device.

The associations between the various oral and nutritional behaviors are shown in **Table V**. Flossing was significantly, albeit weakly, intercorrelated with dental visits, brushing and use of an interdental device. The nutritional measures — snacking between meals and number of cariogenic foods consumed — appear as isolated behaviors independent of the other dental practices.

The distributions of number of optimal behaviors for the oral health and nutritional indices are shown in **Table VI**. Given the high prevalence of tooth brushing, scores of 1.0 or less were found for few respondents (23 per cent) on the dental behavior index. The reverse was found for nutritional measures, with the majority (66 per cent) having a score of zero. Only gender was significantly related to the nutritional index, with females more likely to have favorable scores, i.e. higher than zero (37 per cent, versus 30 per cent for males; $p < .01$). All variables significant at the bivariate level on the index of dental behaviors — age, gender, education and being of Italian ethnic origin — were entered into logistic regression. Categorical variables were reduced to binary variables coded 0 (numerically largest category) or 1 (numerically smallest category). The results are shown in **Table VII**. Higher scores on the index of dental preventive behaviors were found for females,

younger subjects, those with higher education and non-Italian respondents.

Preventive Oral Health Behaviors: Edentulous Only

Overall, the majority (87 per cent) of edentulous respondents reported optimal denture cleaning, night denture removal (51 per cent) and checking of gums and mouth (68 per cent) (**Table VIII**). However, only a few (12 per cent) had made a preventive dental visit within the previous two years, and one-third (32 per cent) reported never checking for oral lesions. Females were significantly more likely to clean dentures twice or more per day and tended to self-examine more frequently than did males. Males and those in the 18 to 64 year age group were more likely to report preventive visiting, although the numbers involved were too small for statistical analyses.

On an index of optimal behaviors, less than one half (45 per cent) of all the edentulous reported three practices (**Table VIII**). No significant gender or age group differences were found.

Discussion

This paper has presented data on the oral health behaviors of a multicultural adult population, aged 18 and over, based on 1,050 responses to a mail survey. Of particular interest was the influence of ethnic/racial origins on response rates to a mail survey and on oral health behaviors. Compared to a previous dental mail survey in a multicultural community,²⁸ the response to this survey was lower (56 per cent compared to 68 per cent), but it was virtually identical to the more recent self-complete ques-

tionnaire in the 1990 Ontario Health Survey (58 per cent). The response to mail surveys, in general, may have declined, given that other recent surveys report response rates as low as 26 per cent.²⁹ In considering the atypical response rate of North York to the Ontario Health Survey, it may be that this community is unique in its reluctance to respond to one of the many requests that, today, demand one's daily attention. This reluctance, however, appears to be evenly distributed among the population. Comparisons to the most recently available census data on a number of demographic and ethnic/racial variables indicated little bias in response patterns. Despite probable language barriers due to the use of an English-only questionnaire, the sample of responders reported in this paper appears closely representative of the North York population on measures of age, gender, place of birth, mother tongue and ethnic/racial origin.

In terms of oral health behaviors for dentate respondents, the very high rate reported for daily tooth brushing (96 per cent) was consistent with other studies,^{3,4,5} as was the moderately high rate of 69 per cent for yearly preventive visits.^{3,6-9,13} The rate of 25 per cent for use of an interdental device paralleled Finnish and Norwegian studies (30 and 25 per cent, respectively).^{5,6} Although self-reports of health behaviors can be subject to memory distortion or social desirability factors,²⁷ the rates reported here, with the exception of flossing, were consistent with studies in Canada and other countries. The daily flossing rate was, however, somewhat of an anomaly. Although less than one-



Table VIII
Preventive Oral Health Behaviors by Gender and Age (%): Edentulous Only

	All n ² = 74	Males 30	Females 42	p ¹	18-64 16	65 & over 64	p
Preventive Visiting							
Within past two years	12.2	20.0	4.8	—	25.0	7.1	—
Longer than two years	87.8	80.0	95.2		75.0	92.9	
Denture Cleaning:							
Few times/week or less	12.5	13.3	12.2		12.5	12.7	
Once per day	48.6	66.7	36.6	*	50.0	49.1	n.s.
Twice or more per day	38.9	20.0	51.2		37.5	38.2	
Night Denture Removal:							
Never	25.0	20.0	26.8		25.0	23.6	
Occasionally	23.6	23.3	24.4	n.s.	31.3	21.8	—
Every night	51.4	56.7	48.8		43.8	54.5	
Check Gums and Mouth:							
Never	32.4	36.7	30.0		43.8	29.6	
Monthly or weekly	23.9	20.0	25.0	n.s.	12.5	25.9	
Several times per week	18.3	16.7	20.0		18.8	18.5	—
Once per day	25.4	26.7	25.0		25.0	25.9	
Index of Optimal Behaviors:							
One or less	23.9	26.7	22.5		31.3	22.2	
Two	31.0	16.7	42.5	n.s.	31.3	31.5	—
Three or four	45.1	56.7	35.0		37.5	45.3	

¹ — denotes n's too small for statistical analysis. ²N's may vary due to missing cases.

*p < 0.05.

quarter of the respondents in this study (22 per cent) reported daily flossing, the rate was higher than the one reported in national studies in Finland (three per cent),⁵ Norway (nine per cent)⁶ and the United States (12 per cent).⁷ This flossing rate was lower than the rate reported for housing-unit residents in the Detroit, Michigan, tricounty area (32 per cent),¹¹ but virtually identical to the rate reported in one other Canadian study, where a rate of 21 per cent was found for Ontario adults aged 50 and over,¹² and very similar to the 18 per cent rate found in a national poll conducted by the Canadian Dental Association.⁸ It may be that the Dental Awareness Program (DAP) launched by CDA in 1985 to increase awareness of the essential components of good dental health

continues to be translated into the same action that witnessed an increase in daily flossing from 12 per cent in 1985 to 18 per cent in 1988.⁸

As in other studies examining oral preventive behaviors, females^{3,4,6,7,9,11,12} and those with higher educations^{3,6,11} were significantly more likely to report higher rates of optimal behaviors. Unlike other studies,^{3,4,6,11,13,14} income was not a significant factor here. Although younger age groups were found to have higher levels at the bivariate levels, age did not emerge as a substantively significant predictor of preventive behavior when controlling for other factors. The paucity of Canadian data on ethnic/racial variations in the practise of health behaviors prevents comparisons of the finding of lower lev-

els of oral self-care in those reporting Italian origin in this study to the findings of other studies. However, this finding does suggest that members of certain ethnic/racial groups may be at greater risk for oral disease. Consequently, planning is currently in progress for a study that will use a focus group format, with specific ethnic/racial groups, to provide valuable data on variations in oral health attitudes, knowledge, beliefs and self-care behaviors.

While the majority of edentulous respondents reported optimal levels of denture cleaning, less desirable levels of preventive visiting, night denture removal and oral self-examination were evident.

Recent Ontario government directives have stated, as one of their "First Health Goals," an intention

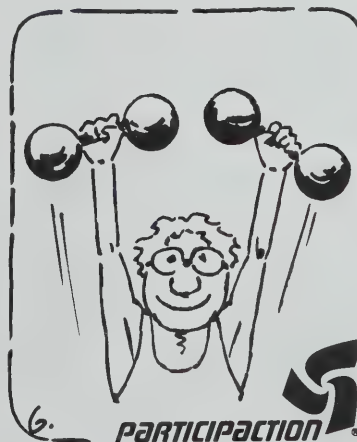
to shift the emphasis in health care to disease prevention and health promotion.^{30,31} It is evident from these data that widespread education efforts to promote the practise of oral preventive behaviors in addition to tooth brushing and denture cleaning is imperative if the goal of oral disease prevention is to be addressed. The role of the dentist and hygienist in educating, monitoring and encouraging individuals is of even greater importance in these times of economic restraint, when public health departments must target health promotion programs to those most in need. These data suggest that in the City of North York, males, those with lower educations, those of Italian ethnic origin and the edentulous should receive high priority in the targeting of oral health promotion programs.

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A Fissure Sealant Pilot Project In a Third Party Insurance Program In Manitoba

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ABSTRACT

The Manitoba Children's Dental Program provides children living in rural Manitoba with provincially-subsidized dental services through private dental offices and school-based clinics.

In 1989, the Manitoba government funded a fissure sealant pilot project for an initial period of two years. The first and second molar teeth of high-risk children were targeted for the study. Light-cured Fluoroshield pit and fissure sealant and Max Curing Lites were provided by L.D. Caulk for the sealant trial. After two years, evaluation focused on three specific areas: a) retention rates; b) was there a trend toward decreased treatment requirements?; and c) were sealants a cost-effective measure in preventing dental disease?

A total of 1,631 children received fissure sealants during the study. The majority of these sealants, 62.5 per cent, were placed on six-year molars, while the remainder, 37.4 per cent, were placed on 12-year molars. One hundred children were recalled for clinical evaluation. Retention rates averaged as follows: 85 per cent completely present, 13 per cent partially present and two per cent failed. Children in the sample area experienced a decrease in their need for one- and two-surface res-

torations that was almost double the decrease experienced by children in the equivalent control group (18.5 per cent need decrease in the sample area versus a 10.9 per cent need decrease in the control group over the two years of the study).

It was subsequently concluded that: average retention rates for fissure sealants approximated 85 per cent; sealants can decrease treatment requirements by up to an additional eight per cent when used in conjunction with other preventive practices; low caries detection under sealants may be attributed to fluoride-releasing mechanisms within sealant material; and sealants are a cost-effective preventive measure with respect to reducing the need to restore and re-restore teeth.

SOMMAIRE

Au Manitoba, grâce au Programme provincial de soins dentaires pour les enfants, ceux des zones rurales obtiennent des services défrayés par le gouvernement dans des cabinets privés ou des cliniques scolaires.

En 1989, le gouvernement du Manitoba a commandé, pour une première période de deux ans, une étude pilote sur les matériaux servant au scellement des puits et fissures. Pour les fins de l'étude, on a

choisi les premières et deuxième molaires des enfants à risques élevés, et la société L.D. Caulk a fourni des matériaux de scellement polymérisés de marque Fluoroshield et Max Curing Lites. Après deux ans, l'évaluation s'est faite en fonction de trois questions précises: a) quel est le taux de rétention? b) le nombre des traitements nécessaires a-t-il diminué? et c) est-ce une mesure de prévention rentable?

En tout, 1 631 enfants ont participé à l'étude. La majorité des matériaux de scellement (62,5 p. cent) a été appliquée à des molaires de 6 ans et le reste à des molaires de 12 ans. Pour l'examen clinique, on a rappelé 100 enfants. Dans 85 p. cent des cas, le taux de rétention était une réussite totale, dans 13 p. cent des cas une réussite partielle, et dans 2 p. cent des cas un échec. Pour les restaurations nécessaires aux surfaces, leur nombre avait baissé d'une ou deux, soit presque le double de ce qu'on a pu observer chez des enfants d'un groupe témoin (une baisse de 18,5 p. cent chez les enfants qui avaient participé à l'étude par rapport à 10,9 p. cent chez les enfants du groupe témoin).

On a donc conclu que le taux de rétention des matériaux de scellement est d'environ 85 p. cent en moyenne; que ces matériaux

contribuent à faire baisser de 8 p. cent le nombre des restaurations nécessaires lorsque d'autres mesures de prévention sont pratiquées; que peu de caries se forment sous ces matériaux à cause du fluorure qu'ils libèrent; et enfin qu'ils constituent une mesure de prévention rentable pour réduire le nombre des premières restaurations et de leurs reprises.

Introduction

The Manitoba Children's Dental Program provided provincially-subsidized dental treatment services to about 50,000 rural children from six to 14 years of age. Approximately 80 per cent of eligible children received treatment.

Eligible children were assigned to one of two modes of program delivery according to their place of residence: a) private dental offices; or b) school-based clinics. Approximately half of the dental treatment delivered through the program was provided in the private office mode under a fee-for-service agreement with the Manitoba Dental Association. School-based treatment services were provided by salaried dentists, dental nurses and dental assistants.

In March 1989, the provincial government reallocated resources from the Children's Dental Program to fund a fissure sealant pilot project in rural Manitoba. It was determined that the initial period for the project would be two years, although it was recognized that the real effects of the sealant program could take up to five years to be seen. The interim two-year report was to address three specific areas:

1. Evaluate the retention rates of fissure sealants after two years;
2. Determine if a trend toward decreased treatment requirements was becoming apparent;
3. Evaluate the cost effectiveness of fissure sealants in rural areas in Manitoba.

Materials and Methods

Four Manitoba school divisions were selected from the 36 divisions in which the Children's Dental Program operated. The sampling was

Table I

Retention Rates Of Sealants By Tooth Number

Tooth	Percentage Completely Present	Percentage Partially Present	Percentage Failed
1st Molars	87	11.5	1.5
2nd Molars	79	15	6
Average	85	13	2

Table II

Total One- and Two-Surface Restorations Performed On All First and Second Molars on Children In Sample Areas Compared With All Other Rural School Divisions (Control Group)

Years	Sample Area	% Decrease	Control Group	% Decrease
1988/89	1,629	—	15,523	—
1990/91	1,325	18.7	13,833	10.9

stratified so that the four divisions would accurately represent the variables of north and south geographical differences, fluoridation status and socio-economic status. Care was also taken to ensure that the sample reflected the province's delivery mode structure (i.e. it included two fee-for-service and two salaried staff divisions).

Effectively, 5,500 children in the four selected divisions were eligible to receive dental care under the Children's Dental Program. A total of 1,631 sealants were placed during the two years of the study. Children in the non-selected school divisions, where the dental program continued unchanged, acted as the study control group.

The sealant project was evaluated by a pediatric dentist from the University of Manitoba's dental faculty, and included a detailed examination of 100 children who had received sealants. These children, who had a total of 232 teeth sealed, were randomly selected from each of the four school divisions through a computer alpha listings sampling.

Throughout the study, Fluoroshield (L.D. Caulk Division, Dentsply International, Milford, Del.), a light-cured pit and fissure sealant, and L.D. Caulk Max Curing Lites were used by all operators.

Depending on the delivery mode of the school divisions in-

involved in the project, and the staffing within private offices, participating operators included dentists, dental therapists, dental hygienists and phase II dental assistants. No attempt was made to differentiate between provider types or to determine the effectiveness of the fissure sealant material used in the project relative to other available sealant materials. However, due to the extensive literature on the criteria for determining which surfaces benefit from the placement of sealants,¹⁻³ the surfaces covered under the project remained the same for all operators.

The study protocol, sampling, evaluation criteria and project guidelines were reviewed by Dr. Ronald Jordan, the dean of the University of Manitoba's dental faculty, prior to project commencement. Program utilization rates in the sample and control areas remained stable during the two-year study period.

High Risk Targeting

Criteria for targeting sealants to high-risk children and teeth were based on current dental literature.⁴⁻⁸ Once these criteria were established, they were explained to dentists at a calibration lecture provided by a pediatric dentist from the department of preventive dental science, faculty of dentistry,



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Fig. 1: Sealant on 11-year-old patient's tooth # 26 for three years.

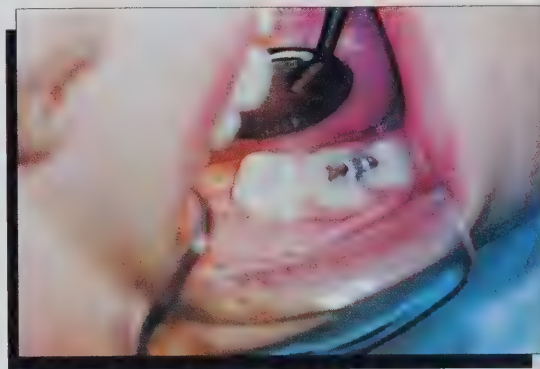


Fig. 2: Sealant on seven-year-old patient's tooth # 47 for three years.

University of Manitoba. These criteria included:

Age Targeting:

- Only children 6-8 years of age
- Only children 12-14 years of age

Tooth Targeting:

- Only first permanent molars of 6-8 year olds
- Only second permanent molars of 12-14 year olds

Tooth Surface Targeting:

- Only specific tooth surfaces of first and second permanent molars (occlusal surfaces, buccal pits on lowers, lingual pits and/or fissures on uppers)

High Risk Tooth Targeting:

- Only where pits and fissures are deep and sticky or discolored
- Patient must have exposure to some form of fluoride
- Patient must have no sign of interproximal decay on radiographs

Results

A total of 1,631 sealants were placed during the two-year study period. Of these sealants, 1,021 (62.6 per cent) were on six-year molars and 610 (37.4 per cent) were on 12-year molars. Due to the high-risk targeting criteria established for the project, no patient received sealants on both six-year and 12-year molars. An average of two to three sealants were provided per patient. **Table I** shows the retention rates of sealants on first and second molars. Retention rate was classified as completely present (C), partially present (P) or failed (F). Any teeth having areas of

decay necessitating restoration were considered in the last category, i.e. failed.

As can be seen from **Table I**, the average retention rate for sealants placed on first permanent molars was 87 per cent completely present, 11.5 per cent partially present and only 1.5 per cent failed. Average results for sealants placed on second permanent molars were 79 per cent completely present, 15 per cent partially present and six per cent failed. This resulted in a grand total of 85 per cent (196 sealants) completely present, 13 per cent (30 sealants) partially present and two per cent (six sealants) failed.

Table II shows the number of one- and two-surface restorations performed on the first and second molars of children in the sample area and all other areas (control), and compares the percentage change from before the commencement of the project to a two-year interim evaluation point.

The decrease in one- and two-surface restorations in the control area amounted to 10.9 per cent (15,523 to 13,833) over a two-year period (April 1, 1989, to March 31, 1991).

During the same time frame, the number of one- and two-surface restorations in the sample group decreased by 18.7 per cent (1,629 to 1,325). In effect, children in the sample area enjoyed a decrease in need for one- and two-surface restorations that was almost double that of children in an equivalent control group (18.7 per cent de-

crease in sample versus 10.9 per cent decrease in control).

This comparison involves the total requirements for one- and two-surface restorations. Therefore, the difference in non-interproximal two-surface restorations (i.e. OB and OL) would be even greater when comparing the sample and control groups.

Discussion

An initial examination of the results indicates that the level of acceptance for sealant application was extremely high by both private practice and public health providers. The fact that 62 per cent of the sealants were placed on first molars is also very positive from a third-party perspective, as there was some concern, initially, that operators would rush to place sealants on 12-year molars before participating children were excluded from the program at 14 years of age. This did not occur. In addition, it is more cost effective to place sealants on first molars, as decay will be prevented from an earlier age.

It is interesting to note that 2,954 one- and two-surface restorations and 1,631 sealants were placed on 4,585 six- and 12-year molars of eligible children in the sample area, out of a potential total of 32,500 molars (14 per cent of teeth were treated).

More sealants were provided in the higher decay areas of the sample, as there were obviously more high-risk children and teeth in these areas. As an average of 2.32 molars out of four were sealed per

patient, it is clear that the remaining 1.68 teeth were either of very low risk, and hence needed no sealant, or that frank caries had been detected and restorations placed in these teeth.

From a delivery perspective, these initial results show that a high level of co-operation existed between the private sector, the public health component and the government funding agency throughout the duration and final evaluation of the sealant project.

A more detailed examination of the results reveals that almost 90 per cent of the sealants placed on first molars were fully retained after completion of the two-year trial. Interestingly, over 50 per cent of the first- and second-molar sealants classified as partially present actually appeared in this category due to loss of sealant from the buccal surfaces of lower 6's and 7's, or from the lingual surfaces of upper first permanent molars. This means that the original single occlusal surface was functional and intact in over 50 per cent of cases where the sealants were classified as partially present. The reason these surfaces were sealed in the first place was unclear. However, it can be assumed that it was, in part, due to the nature of the study and the interest among all providers to seal all surfaces that may have met the project's high risk criteria.

As the clinical examination revealed that there was no logical reason to re-seal these buccal or lingual surfaces, the actual success rate, based on overall retention, was over 92 per cent. The average two per cent failure rate was extremely low. It is quite conceivable that as this average is lower than the figure obtained in many other studies,^{1,9,10} the inclusion of fluoride in Fluoroshield Sealant may have contributed to the success rate by preventing decay under the sealant.

The data presented in **Table II** show that the decrease in need for one- and two-surface restorations by children in the sample sealant group was almost double the decrease seen in the control group. In fact, the 10.9 per cent decrease seen in the control group is inter-

esting in itself. It appears that the overall need for restorations in children is decreasing by approximately five per cent per annum in areas where standard preventive practices such as water fluoridation, school classroom rinse and school classroom dental education sessions are in place. This equates with other studies, and is a noteworthy epidemiological figure in terms of manpower projections, as well as for private dental practitioners who wish to tailor their offices to specific target groups or services.

The overall acceptance of the procedure by providers, the high retention rates, the reduction in dental disease and the reduction of subsequent and more radical re-restoration should also be of considerable interest to private, third-party, dental indemnity plan administrators, as plans have been slow to accept sealants as a covered benefit. Clearly, in this project, although actual savings were not estimated, sealants resulted in preserved tooth structure and a consequent reduction in treatment costs, less trauma to the pediatric patient and an overall time-saving benefit to both patients and providers.

Conclusion

The following conclusions can be drawn from this pilot project:

1. The average retention rate for sealants was 85 per cent.
2. The need for one- and two-surface restorations by children in the sample area decreased by almost twice as much as it did for children in an equivalent control group.
3. Failed sealants accounted for only two per cent of the total number of sealants evaluated. This low figure could be attributed to the fluoride release mechanism of the Fluoroshield material, although further clinical studies would be necessary to confirm this.
4. Sealants are a cost effective preventive measure in the reduction of the restoration and subsequent re-restoration of teeth.

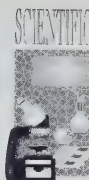
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Toradol (ketorolac tromethamine) is a non-steroidal anti-inflammatory drug (NSAID) that exhibits analgesic activity mediated by peripheral effects. Ketorolac inhibits the synthesis of prostaglandins through inhibition of the cyclo-oxygenase enzyme system. At analgesic doses, it has minimal anti-inflammatory and antipyretic activity. Pain relief is comparable following the administration of ketorolac by intramuscular or oral routes. The peak analgesic effect occurs at 2-3 hours post-dosing with no evidence of a statistically significant difference over the recommended dosage range. The greatest difference between large and small doses of Toradol administered by either route is in the duration of analgesia. Ketorolac tromethamine is rapidly and completely absorbed when administered by either the oral or the intramuscular route. The pharmacokinetics are linear following single and multiple dosing. Steady state plasma levels are attained after one day of Q.I.D. dosing. Following oral administration, peak plasma concentrations of 0.7 to 1.1 µg/mL occurred at an average of 44 minutes after a single 10 mg dose. The terminal plasma elimination half-life ranged between 2.4 and 9.0 hours in healthy adults, while in elderly subjects (mean age = 72 years), it ranged between 4.3 and 7.6 hours. A high fat meal decreased the rate, but not the extent, of absorption of oral ketorolac tromethamine.

The use of an antacid had no effect on the pharmacokinetics of ketorolac. Following intramuscular administration, peak plasma concentrations of 2.2 to 3.0 µg/mL occurred an average of 50 minutes after a single 30 mg dose. The terminal plasma half-life ranged between 3.5 and 9.2 hours in young adults and between 4.7 and 8.6 hours in elderly subjects (mean age = 72 years). In renally impaired patients there is a reduction in clearance and an increase in the terminal half-life of ketorolac tromethamine (see table below). The primary route of excretion of ketorolac tromethamine and its metabolites (conjugates and the p-hydroxy metabolite) is in the urine (91.4%) with the remainder (6.1%) being excreted in the feces. More than 99% of the ketorolac in plasma is protein bound over a wide concentration range. The hemodynamics of anesthetized patients were not altered by parenteral administration of Toradol.

THE INFLUENCE OF AGE, LIVER AND KIDNEY FUNCTION ON THE CLEARANCE AND TERMINAL HALF-LIFE OF TORADOL IM¹ AND ORAL²

TYPES OF SUBJECTS	TOTAL CLEARANCE (in L/h/kg) ³		TERMINAL HALF-LIFE (in hours)	
	IM MEAN (range)	ORAL MEAN (range)	IM MEAN (range)	ORAL MEAN (range)
Normal Subjects IM (n=54) Oral (n=77)	0.023 (0.010-0.046)	0.025 (0.013-0.050)	5.3 (3.5-9.2)	5.3 (2.4-9.0)
Healthy Elderly Subjects IM (n=13), Oral (n=12) (mean age = 72, range = 65-78)	0.019 (0.013-0.034)	0.024 (0.018-0.034)	7.0 (4.7-8.6)	6.1 (4.3-7.6)
Patients with Hepatic Dysfunction IM and Oral (n=7)	0.029 (0.013-0.066)	0.033 (0.019-0.051)	5.4 (2.2-6.9)	4.5 (1.6-7.6)
Patients with Renal Impairment IM and Oral (n=9) (serum creatinine 1.9-5.0 mg/dL)	0.014 (0.007-0.043)	0.016 (0.007-0.052)	10.3 (8.1-15.7)	10.8 (3.4-18.9)
Renal Dialysis Patients IM (n=9)	0.016 (0.003-0.036)		13.6 (8.0-39.1)	

¹ Estimated from 30 mg single IM doses of ketorolac tromethamine

² Estimated from 10 mg single oral doses of ketorolac tromethamine

³ Litres/hour/kilogram

INDICATIONS:

Oral Route: Orally administered Toradol (ketorolac tromethamine) is indicated for the short-term management of mild to moderately severe pain, including post-surgical pain (such as general, orthopaedic and dental surgery), acute musculoskeletal trauma pain and post-partum uterine cramping pain.

Intramuscular Route: Intramuscular injection of Toradol is indicated for the short-term management of moderate to severe pain, including pain following major abdominal, orthopaedic and gynecological operative procedures.

CONTRAINDICATIONS:

Hypersensitivity: Like other non-steroidal anti-inflammatory drugs, Toradol (ketorolac tromethamine) has been associated with hypersensitivity reactions. Toradol should not be used when there is a known or suspected hypersensitivity to the drug. Because of the possibility of cross-sensitivity, Toradol should not be used in patients with the complete or partial syndrome of nasal polyps, angioedema, bronchospastic reactivity (e.g. asthma) or other allergic manifestations to acetylsalicylic acid (ASA) or other non-steroidal anti-inflammatory drugs. Severe and fatal anaphylactoid reactions have occurred in such individuals.

Gastrointestinal: As with other NSAIDs, Toradol also should not be used in patients with peptic ulcer or active inflammatory disease of the gastrointestinal system. Severe and fatal reactions have occurred in such individuals.

WARNINGS:

The long-term administration of Toradol (ketorolac tromethamine) is not recommended. The most serious risks associated with NSAIDs including Toradol are:

Gastrointestinal Ulcerations, Bleeding and Perforation: Serious gastrointestinal toxicity, such as bleeding, ulceration, and perforation, can occur at any time, with or without warning symptoms, during therapy with non-steroidal anti-inflammatory drugs. To date, studies with NSAIDs have not identified any subset of patients not at risk for developing peptic ulceration and bleeding. Post-marketing experience with Toradol suggests that there may be a greater risk of gastrointestinal ulcerations, bleeding, and perforation in the elderly, and most spontaneous reports of fatal gastrointestinal events are in the aged population.

LONG-TERM USE OF TORADOL: The oral use of Toradol 10 mg QID on a long-term basis is associated with more gastrointestinal tract adverse effects than is ASA 650 mg QID.

In a clinical trial in 823 patients with chronic pain states comparing Toradol tablets 10 mg QID (553 patients) with ASA 650 mg QID (270 patients), during the first week there was a 2.4% dropout rate because of upper GI complaints in the Toradol tablets treated patients as compared with 0.4% rate in the ASA treated group. After the first 2 weeks, the dropout rates due to GI pain or discomfort were comparable in both treatment groups. The time-adjusted percentages, which are not statistically significantly different, of patients who developed ulcers or upper GI bleeding are as follows:

	CUMULATIVE OCCURRENCE	
	KETOROLAC	ASA
INTERVAL		
≤ 3 months	0.69*	0*
≤ 6 months	1.59*	0.73*

*There was no statistically significant difference between ketorolac and ASA at either of the intervals tested.

PHYSICIANS SHOULD CAREFULLY WEIGH THE POTENTIAL RISKS AND BENEFITS OF USING TORADOL TABLETS ON A LONG-TERM BASIS. PATIENTS SHOULD BE INSTRUCTED TO WATCH FOR SIGNS OF SERIOUS GI ADVERSE EVENTS AND THEY SHOULD BE MONITORED MORE CLOSELY THAN IF THEY WERE ON ANOTHER NSAID.

Renal Toxicity: The following renal abnormalities have been associated with Toradol and other drugs that inhibit renal prostaglandin biosynthesis: acute renal failure, nephrotic syndrome, interstitial nephritis, renal papillary necrosis.

Haemorrhage: Postoperative haematomas and other symptoms of wound bleeding have been reported in association with the perioperative use of intramuscular Toradol. If Toradol is to be administered to patients who have coagulation disorders or who are receiving drug therapy that interferes with haemostasis, careful observation is advised.

Hypersensitivity Reactions: The possibility of severe or fatal hypersensitivity reactions should be considered, even for patients with no known history of previous exposure or hypersensitivity to Toradol or other NSAIDs. As with other NSAIDs, patients should be questioned for history of allergy to NSAIDs or ASA or for the syndrome consisting of nasal polyps, ASA allergy and asthma before being prescribed Toradol. Asthmatic patients with triad asthma (the syndrome of nasal polyps, asthma and hypersensitivity to ASA or other NSAIDs) may be at particular risk for severe hypersensitivity reactions.

Other NSAIDs: Ketorolac tromethamine is not recommended for concurrent use with other NSAIDs because of the potential for additive side effects.

Use in Pregnancy and Lactation: The administration of ketorolac tromethamine is not recommended during pregnancy or lactation. After 1 day at 10 mg QID, oral dosing, Toradol has been detected in the milk of lactating women at a maximum concentration of 7.9 ng/mL.

Use in Labour: Ketorolac tromethamine is not recommended for use as an obstetrical preoperative medication or for obstetrical analgesia because of the known effects of NSAIDs on uterine contraction and fetal circulation.

Use in Children: Safety and efficacy in children have not been established. Therefore, Toradol is not recommended for use in children under age 16.

Use in the Elderly: Because ketorolac is cleared somewhat more slowly by the elderly (See PHARMACOKINETICS) who are also more sensitive to the gastrointestinal and renal effects of NSAIDs (See WARNINGS and PRECAUTIONS), extra caution and the lowest effective dose (See DOSAGE AND ADMINISTRATION) should be used.

PRECAUTIONS:

Physicians should be alert to the pharmacologic similarity of Toradol (ketorolac tromethamine) to other non-steroidal anti-inflammatory drugs that inhibit cyclo-oxygenase. Toradol is not an anesthetic agent and possesses no sedative or anxiolytic properties.

Gastrointestinal Effects: Close medical supervision is recommended in patient prone to gastrointestinal tract irritation, particularly those with a history of peptic ulcer, diverticulosis or other inflammatory disease of the gastrointestinal tract. In these cases, the physician must weigh the benefits of treatment against the possible hazards. Patients taking an NSAID including ketorolac tromethamine should be instructed to contact a physician immediately if they experience symptoms or signs suggestive of peptic ulceration or gastrointestinal bleeding. These reactions can occur at any time during the treatment. If peptic ulceration is suspected or confirmed, or if gastrointestinal bleeding occurs, ketorolac tromethamine should be discontinued and appropriate treatment instituted with close patient monitoring.

Renal Effects: As with other drugs that inhibit prostaglandin biosynthesis, elevation of blood urea nitrogen (BUN) and creatinine have been reported in clinical trials with (ketorolac tromethamine). Since ketorolac tromethamine and its metabolites are excreted primarily by the kidney, the following precautions are indicated for patients with: **Severely impaired renal function** (serum creatinine values greater than 5 mg/dL, 442 µmol/L): Toradol is not recommended; **Moderately impaired renal function** (serum creatinine values ranging from 1.9 to 5.0 mg/dL, 168 to 442 µmol/L) - The total daily dose of ketorolac tromethamine should be reduced by half. In these patients the rate of ketorolac tromethamine clearance was reduced to approximately half of normal. Patients who are volume depleted may be dependent on renal prostaglandin production to maintain renal perfusion and, therefore, glomerular filtration rate. In such patients, the use of drugs which inhibit prostaglandin synthesis has been associated with further decreases in renal blood flow. Predisposing factors include sepsis, impaired renal function, heart failure, liver dysfunction, diuretic therapy, and advanced age. Caution is advised if ketorolac tromethamine is used in such circumstances. Close monitoring of urine output, serum urea and serum creatinine is recommended until renal function recovers.

Hepatic Effects: Meaningful elevations (greater than 3 times normal) of serum transaminases (glutamate pyruvate (SGPT or ALT) and glutamic oxalacetic (SGOT or AST)), occurred in controlled clinical trials in less than 1% of patients. If clinical signs and symptoms consistent with liver disease develop, or if systemic manifestations occur (e.g., eosinophilia, rash, etc.), ketorolac tromethamine should be discontinued. Patients with impaired hepatic function from cirrhosis do not have any clinically important changes in ketorolac tromethamine clearance. Studies in patients with active hepatitis or cholestasis have not been performed.

Fluid and Electrolyte Balance: Fluid retention and edema have been observed in patients treated with Toradol. Therefore, as with many other NSAIDs, the possibility of precipitating congestive heart failure in elderly patients or those with compromised cardiac function should be considered. Toradol should be used with caution in patients with cardiac decompensated hypertension or other conditions which cause a predisposition to fluid retention.

Hematologic Effects: Ketorolac tromethamine inhibits platelet function and may prolong bleeding time. It does not affect platelet count, prothrombin time (PT) or partial thromboplastin time (PTT). Unlike the prolonged effects from ASA the inhibition of platelet function by ketorolac tromethamine is normalized within 24 to 48 hours after the drug is discontinued. Patients on full anti-coagulation therapy (e.g. heparin or dicumarol derivatives) may be at increased risk of bleeding if given Toradol concurrently. Thus, the benefit should be weighed against this risk. The concomitant use of Toradol and heparin (5000 U s.c. BID) appears to be associated with less risk (see DRUG INTERACTIONS). In patients receiving anticoagulants, the risk of intramuscular haematoma formation from Toradol IM injections may be increased. In post-marketing experience, postoperative wound haemorrhage has been reported with the use of Toradol. Therefore, caution should be exercised when strict haemostasis is critical. Toradol IM

not recommended as a pre-operative or intra-operative medication because of the risk of excessive bleeding. Blood dyscrasias associated with the use of NSAIDs are rare, but could occur with severe consequences.

Infection: In common with other non-steroidal anti-inflammatory drugs, ketorolac tromethamine may mask the usual signs of infection.

DRUG INTERACTIONS:

Protein Binding: Toradol (ketorolac tromethamine) is highly bound to human plasma protein (mean 99.2%) and binding is independent of concentration. As ketorolac tromethamine is a highly potent drug and present in low concentrations in plasma, it would not be expected to displace other protein-bound drugs significantly. Therapeutic concentrations of digoxin, warfarin, acetaminophen, phenytoin, and tolbutamide did not alter ketorolac tromethamine protein binding.

Anticoagulant Therapy: Prothrombin time should be carefully monitored in all patients receiving oral anticoagulant therapy concomitantly with ketorolac tromethamine. Toradol IM given with two doses of 5000 U of heparin to 11 healthy volunteers resulted in a mean template bleeding time of 6.4 min (3.2-11.4 min) compared to a mean of 6.0 min (3.4-7.5 min) for heparin alone and 5.1 min (3.5-8.5 min) for placebo. The *in vitro* binding of warfarin to plasma proteins is only slightly reduced by ketorolac tromethamine (99.5% control vs. 99.3%) at plasma concentrations of 5 to 10 µg/mL.

Digoxin: Ketorolac tromethamine does not alter digoxin protein binding.

Salicylates: *In vitro* studies indicated that, at therapeutic concentrations of salicylates (300 µg/mL), the binding of ketorolac tromethamine was reduced from approximately 99.2% to 97.5% representing a potential two-fold increase in unbound Toradol plasma levels.

Enzyme Induction: There is no evidence, in animal or human studies, that ketorolac tromethamine induces or inhibits the hepatic enzymes capable of metabolizing itself or other drugs. Hence, it would not be expected to alter the pharmacokinetics of other drugs due to enzyme induction or inhibition mechanisms.

Probenecid: Concomitant administration of ketorolac tromethamine and probenecid results in the decreased clearance of ketorolac and a significant increase in ketorolac plasma levels (approximately three-fold increase) and terminal half-life (approximately two-fold increase).

Furosemide: Ketorolac tromethamine reduces the diuretic response to furosemide by approximately 20% in normovolemic subjects.

Lithium: Some NSAIDs have been reported to inhibit renal lithium clearance, leading to an increase in plasma lithium concentrations and potential lithium toxicity. The effect of ketorolac tromethamine on lithium plasma levels has not been studied.

Methotrexate: The concomitant administration of methotrexate and some NSAIDs has been reported to reduce the clearance of methotrexate, thus enhancing its toxicity. The effect of ketorolac tromethamine on methotrexate clearance has not been studied.

Morphine: Intramuscular Toradol has been administered concurrently with morphine in several clinical trials of postoperative pain without evidence of adverse interactions.

ADVERSE EVENTS:

TORADOL TABLETS: Short-Term Patient Studies - The incidence of adverse reactions in 371 patients receiving multiple 10 mg doses of Toradol (ketorolac tromethamine) for pain resulting from surgery or dental extraction during the post-operative period (less than 2 weeks) is listed below. These reactions may or may not be drug related. **Incidence between 4 and 9%:**

Nervous system - somnolence, insomnia; **Digestive system** - nausea. **Incidence between 2 and 3%:** **Nervous system** - nervousness, headache, dizziness; **Digestive system** - diarrhea, dyspepsia, gastrointestinal pain, constipation. **Body as a whole** - fever. **Incidence 1% or Less:** **Nervous system** - abnormal dreams, anxiety, dry mouth, hyperkinesia, paresthesia, increased sweating, euphoria, hallucinations; **Digestive system** - anorexia, flatulence, vomiting, stomatitis, gastritis, gastrointestinal disorder, sore throat; **Body as a whole** - asthenia, pain, back pain; **Cardiovascular system:** vasodilatation, palpitation, migraine, hypertension; **Respiratory system** - cough increased, rhinitis, dry nose; **Musculo-skeletal system** - myalgia, arthralgia; **Skin and appendages** - rash, urticaria; **Special senses** - blurred vision, ear pain; **Urogenital system:** dysuria.

Long-Term Patient Study - The adverse reactions listed below were reported to be probably related to study drug in 553 patients receiving long-term oral therapy (approximately 1 year) with Toradol. **Incidence between 10 and 12%:** **Digestive system** - dyspepsia, gastrointestinal pain.

Incidence Between 4 and 9%: **Digestive system** - nausea, constipation; **Nervous system** - headache. **Incidence Between 2 and 3%:** **Digestive system** - diarrhea, flatulence, gastrointestinal fullness, peptic ulcers; **Nervous system** - Dizziness, somnolence; **Melabolic/Nutritional disorder** - edema. **Incidence 1% or Less:** **Digestive system** - eructation, stomatitis, vomiting, anorexia, duodenal ulcer, gastritis, gastrointestinal hemorrhage, increased appetite, melena, mouth ulceration, rectal bleeding, sore mouth; **Nervous system** - abnormal dreams, anxiety, depression, dry mouth, insomnia, nervousness, paresthesia; **Special senses** - tinnitus, taste perversion, abnormal vision, blurred vision, deafness, lacrimation disorder; **Melabolic/Nutritional disorder** - Weight gain, alkaline phosphatase increase, BUN increased, excessive thirst, generalized edema, hyperuricemia; **Skin and appendages** - pruritus, rash, burning sensation skin; **Body as a whole** - asthenia, pain, back pain, face edema, hernia; **Musculo-skeletal system** - arthralgia, myalgia, joint disorder; **Cardiovascular system:** chest pain, chest pain substernal, migraine; **Respiratory system** - dyspnea, asthma, epistaxis; **Urogenital system** - hematuria, increased urinary frequency, oliguria, polyuria; **Hemic and lymphatic** - Anemia, purpura.

TORADOL IM: The adverse reactions listed below were reported in Toradol IM clinical efficacy trials. In these trials patients (n=660) received either single 30 mg doses (n=151) or multiple 30 mg doses (n=509) over a time period of 5 days or less for pain resulting from surgery.

These reactions may or may not be drug related. **Incidence Between 10 and 13%:** **Nervous system** - somnolence; **Digestive system** - Nausea. **Incidence Between 4 and 9%:** **Nervous system** - headache; **Digestive system** - vomiting; **Injection site** - injection site pain. **Incidence between 2 and 3%:** **Nervous System** - sweating, dizziness; **Cardiovascular system** - vasodilatation. **Incidence 1% or Less:** **Nervous system** - insomnia, increased dry mouth, abnormal dreams, anxiety, depression, paraesthesia, nervousness, paranoid reaction, speech disorder, euphoria, libido increased, excessive thirst, inability to concentrate, stimulation; **Digestive system** - flatulence, anorexia, constipation, diarrhea, dyspepsia, gastrointestinal fullness, gastrointestinal hemorrhage, gastrointestinal pain, melena, sore throat, liver function abnormalities, ectal bleeding, stomatitis; **Cardiovascular system** - hypertension, chest pain, tachycardia, hemorrhage, palpitation, pulmonary embolus, syncope, ventricular tachycardia, pallor, flushing; **Injection site** - injection site reaction; **Body as a whole** - asthenia, fever, back pain, chills, pain, neck pain; **Special senses** - taste perversion, tinnitus, blurred vision, diplopia, retinal hemorrhage; **Musculo-skeletal system** - myalgia, twitching; **Respiratory system** - asthma, cough increased, dyspnea, epistaxis, hiccup, rhinitis; **Skin and appendages** - pruritus, rash, subcutaneous hematoma, skin disorder; **Urogenital system** - dysuria, urinary retention, oliguria, increased urinary frequency, vaginitis; **Melabolic/nutritional disorders** - edema, hypokalemia, hypovolemia **Hemic and lymphatic system** - anemia, coagulation disorder, purpura.

Post-Marketing Experience: The following post-marketing adverse experiences, although rare (1% or less), have been reported for patients who have received either formulation of Toradol.

Renal events - acute renal failure, flank pain with or without haematuria and/or azotemia; **Hypersensitivity reactions:** bronchospasm, laryngeal edema, hypotension, flushing, rash, and anaphylactoid reactions, such reactions have occurred in patients with no prior history of hypersensitivity. **Gastrointestinal events** - gastrointestinal hemorrhage, peptic ulceration, gastrointestinal perforation; **Hematologic events** - postoperative wound haemorrhage, rarely requiring blood transfusion (see PRECAUTIONS), thrombocytopenia; **Central nervous system** - convulsions, abnormal dreams, hallucinations, hyperkinesia, hearing loss; **Cardiovascular** - pulmonary edema; **Dermatology** - Lyell's syndrome, Stevens - Johnson syndrome, exfoliative dermatitis, maculopapular rash.

OVERDOSAGE: The absence of experience with acute overdosage precludes characterization of sequelae and assessment of antidotal efficacy at this time. In a gastroscopic study of healthy subjects, daily doses of 360 mg given over an 8-hour interval for each of five consecutive days (3 times the highest recommended dose) caused pain and peptic ulcers which resolved after discontinuation of dosing.

DOSEAGE AND ADMINISTRATION:

Adults: Dosage should be adjusted according to the severity of the pain and the response of the patient. **Oral:** The usual oral dose of Toradol (ketorolac tromethamine) is 10 mg every 4 to 6 hours for pain as required. Doses exceeding 40 mg per day are not recommended. Toradol is recommended for short-term use only, i.e., for a maximum of a few weeks.

Parenteral: The recommended usual initial dose is 30 mg. Subsequent dosing may be 10 mg to 30 mg every 4-6 hours as needed to control pain. It is recommended that the administration of Toradol IM be limited to short-term therapy (not over 5 days) and the total daily dose should not exceed 120 mg.

This is because the risk of toxicity appears to increase with longer use at recommended doses (see WARNINGS and PRECAUTIONS). The administration of continuous multiple daily doses of Toradol IM has not been extensively studied. There has been limited experience with intramuscular dosing for more than 3 days since the vast majority of patients have transferred to oral medication or no longer required analgesic therapy after this time. In the initial post-operative period, more frequent dosing (e.g. every 2 hours) may be employed but the total daily dosing should not exceed 120 mg/day. If supplementary analgesia is required, a concomitant low dose of opiate can be used.

Patients under 50 kg, over age 65 years, or with less severe pain at baseline: the lower end of the dosage range (10-15 mg 4 times a day) is recommended.

Impaired Renal Function - Moderate - In patients with impaired renal function (serum creatinine values ranging from 1.9 to 5.0 mg/dL or 168 to 442 µmol/L), the total daily dose of Toradol should be reduced by half.

Severe - In patients with severely impaired renal function (serum creatinine values greater than 5 mg/dL or 442 µmol/L) Toradol is not recommended.

Conversion from Parenteral to Oral Therapy: Toradol tablets may be used either as monotherapy or as follow-on therapy to parenteral ketorolac. Toradol IM should be replaced by an oral analgesic as soon as feasible. When Toradol tablets are used as a follow-on therapy to parenteral ketorolac, the total combined daily dose of ketorolac (oral + parenteral) should not exceed 120 mg on the day the change of formulation is made. Subsequent oral dosing should not exceed the recommended daily maximum of 40 mg.

Directions for Use of the Prefilled Syringes: Insert the plunger into the syringe barrel and thread it onto the screw. WITHOUT REMOVING THE NEEDLE GUARD, apply quick, firm pressure to the plunger to break the inner seal. (You will feel it let go). Pull back on the plunger slightly to relieve pressure. Remove the needle guard by twisting as you pull. Use the unit as you would a normal syringe. Dispose of properly. Single use only. Discard Unused Portions. Parenteral drug products should be inspected visually for particulate material and discoloration prior to use. Toradol (ketorolac tromethamine) is a Schedule F drug.

Stability and Storage Recommendations:

Toradol Tablets: Store at room temperature with protection from light.

Toradol IM: Store at room temperature with protection from light.

Availability of Dosage Forms: Toradol (ketorolac tromethamine) is available as 10 mg white round film coated tablets containing ketorolac tromethamine, microcrystalline cellulose, lactose and magnesium stearate with one side printed in red with TORADOL inside bold T and other side with Syntex. Toradol (ketorolac tromethamine) 10 mg tablets are available in bottles of 100 and 500 tablets.

Toradol IM is available in 1 mL ampoules (trays of 10) containing 10 or 30 mg/mL.

Toradol IM is also available in 1 mL syringes (1/box) containing 15 or 30 mg/mL.

Product Monograph available on request.

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BOOK REVIEWS

Handbook of Clinical Anesthesia 2nd Edition

By P.G. Barash, B.F. Cullen
and R.K. Stoelting

1991, J.B. Lippincott Co.,
Philadelphia
642 pages

This soft-cover handbook, despite its thickness, is a very succinct guide to the approach of clinical anesthesia. It is the type of book that can directly accompany the reader throughout his or her clinical practice. While it is not intended as a replacement for a full-scale textbook, its surprisingly in-depth coverage of the subject matter should make it must reading for the new resident about to embark on an anesthesia-related career.

The book is somewhat arbitrarily divided into two major sections. In the first section, the reader is systematically taken through the preoperative anesthesia period, including preoperative evaluation, intraoperative management, anesthesia subspecialties and, finally, postoperative care. This section contains over 30 individual chapters.

The second major section contains another 10-15 chapters, covering topics such as CPR (cardiopulmonary resuscitation) pain management, recovery management, and outpatient anesthesia, as well as eight appendixes. The appendixes make excellent use of tables and algorithms to review the basic electrocardiography, properties of major drugs and diseases, the difficult airway algorithm, the American Society of Anesthesia (ASA)'s standards for anesthesia delivery and care, and the Advanced Cardiac Life Support (ACLS) protocols.

The handbook is not referenced directly in the body of the text, and none of its 44 chapters conclude with a bibliography. However, its excellent coverage of each subject is actually intended as an extension of its parent (and exhaustive) textbook, *Clinical Anesthesia*, which

provides thorough coverage of the subject matter via some 98 contributors.

The author's extensive use of illustrations, algorithms and tables, in particular, helps to summarize and indeed prioritize crucial points pertaining to each clinical situation.

Reviewed by:

E.R. Young, B.Sc., DDS, B.Sc.D., M.Sc., FADSA, Associate professor and head, department of anesthesia, faculty of dentistry, University of Toronto and The Wellesley Hospital, Toronto.

Ethical Questions in Dentistry

By James T. Rule
and Robert M. Veatch

1993, Quintessence Publishing
Co. Inc., Illinois
282 pages

If all that good dentistry required of its practitioners was an acceptable degree of clinical expertise, professional life would be much simpler. But the ethical conflicts so indigenous to today's practice can enormously affect how dentists relate to their patients, to their colleagues, to their profession and, generally, to society. Concerns about poor quality of care, violations of public trust, flagrant advertising, self-regulation, informed consent, interactions with impaired or incompetent colleagues, financial interactions with patients and insurance carriers are issues, among many others, that are inseparable from practice, regardless of whether such practice is in the general or a specialized milieu, in public health, or in dental education and research.

What this book does, quite successfully, is attempt a general approach to ethical reasoning in dentally-related problem solving. Part I, which represents about a quarter of the text, deals essentially with theory and principles, and encompasses a format for resolving ethical questions.

In all, the authors present 111 cases bearing on ethical issues in dentistry. A clear exposition of each case, or in some instances two or three cases, is followed by a discussion. Question after question is posed, inviting readers to use the insights they gained from reading the text, particularly Part I, to arrive at an appropriate response.

Ethical Questions in Dentistry is certainly an appropriate title for this book. However, this reviewer would have been better satisfied had he been able to measure his judgments on the cases in juxtaposition to those of the authors. Although it would have significantly increased the length of the text, it would have been beneficial if the authors, where possible, had offered their responses and then related them to the principles enunciated earlier in the text.

The issue of "informed consent" was rather extensively addressed. For a Canadian readership, that component of the text could be confusing. Probably, in no country in the English- or French-speaking world, has the legal issue of informed consent more clearly or more unequivocally been juridically clarified than it has in Canada.

In the fullness of time, a second edition of this excellent book would be a further welcome addition to the literature of dentistry. One plea, however, is respectfully proffered to the authors with respect to that second edition. Please eliminate the expression "dental work" when what is really meant is dental treatment, care, or service. In acknowledging that the appellation dental work is ubiquitous, it nevertheless suggests a task more related to oral plumbing than to the high degree of professional treatment, care, or service to which every dentist should aspire.

Reviewed by:

Wesley J. Dunn, DDS, Professor emeritus, faculty of dentistry, University of Western Ontario

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We answer to patient demands for convenience and dentist requirements for flexibility by providing appointments that meet the demanding schedules of today's families. Consequently, we enjoy a continuous flow of new patients. And this operating flexibility allows you to take time off on days when others are working.

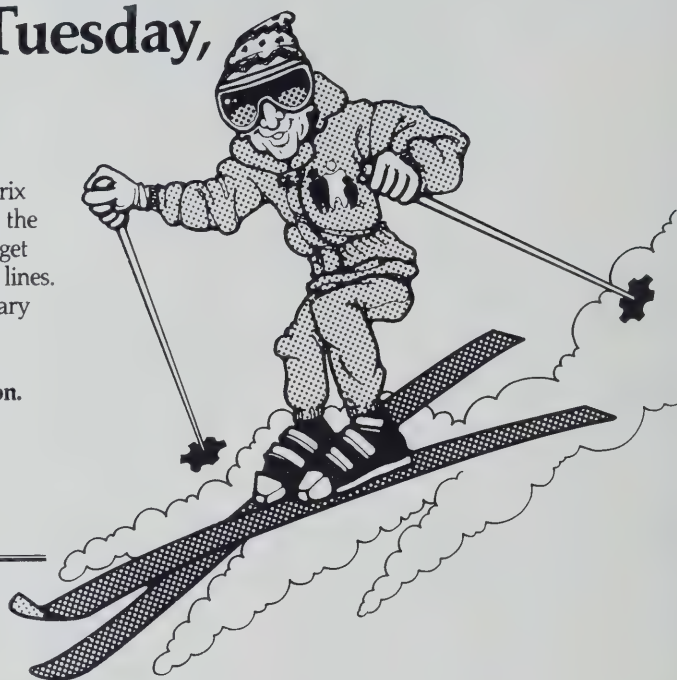
That's why most Dentrix dentists get their time on the ski hill — while the rest get stuck in the weekend lift lines.

Opportunities in Calgary and Winnipeg.

For more information, contact **Dr. Robert Watson.**



#300, 222 - 58th Avenue S.W.
Calgary, Alberta T2H 2S2
Phone: (403) 255-6211
FAX: (403) 253-5014
Toll-Free: 1-800-661-8663



982-2300 or respond to CDA ACCESS Box 2595. (10/03)

ALBERTA - Calgary: For Sale: Busy mall location 35-45 new patients per month, two hygienists, 3,000+ charts with excellent recall system. Exam computerized with a super staff. Five operatories in 1,700 sq. ft. Fully equipped including PAN/CEPH. \$600,000 billings on part-time hours. Dentist leaving for health reasons. Contact Melanie at (403) 262-4538.

(12/02)

ALBERTA - Northern Region: Practice for sale. If you would like to net \$300,000 per year this practice is for you! Very reasonable terms. Please reply to CDA ACCESS Box 2609. (12/02)

SASKATCHEWAN: Large family practice for sale in mid-size Saskatchewan city. Several operatories and X-rays and panelipse, low overhead. Very reasonable, anxious to sell due to health reasons. Please reply to CDA ACCESS Box 2588. (08/13)

MANITOBA - Leaf Rapids: (two hours driving time from Thompson,

MB) Practice for sale or associate wanted, gross \$350,000, situated in a prosperous mining community, 90% insurance, nearest dentist Thompson, MB, three operatories, one panorex. Call anytime (306) 338-3898 business or (306) 338-3728 home. (12/02)

MANITOBA: Very busy general practice in large town, rural Manitoba, modern office, good growth, ideal for two dentists. Owner returning for postgraduate training, willing to assist in transition. Please reply to CDA ACCESS Box 2566. (04/02)

OTTAWA - ONTARIO

Elegant Prosthodontic practice in Medical/Dental Centre. 1,054 sq. ft. condominium in prime location with superior leasehold improvements. Minimum competition for high gross with low overhead. Large patient pool for all phases of Prosthodontic work. Patients on waiting list for immediate commencement. Well trained staff with in-house lab. Call (613) 833-0157. (01/03)

ONTARIO - London : One year's free rent! Offered by The Thorndale Lions

Medical/Dental Centre for a dentist to start his or her own dental practice. Situated in a modern (five-year-old) medical/dental building 15 km north-east of London. Contact Paul Massey, R.R. #3, Thorndale, Ont. N0M 2P0, (519) 268-3027. (09/02)

ONTARIO

Dynamic practice for sale 90 minutes from Toronto. Enjoy working in a well organized, sophisticated, modern, busy practice without the hassles of the city. This large practice is situated in a beautiful professionally designed building. A fully developed perio program is in place with over 85% hygiene retention. Quality dental care provided with emphasis on complete dentistry. *Last year's gross just under \$1,900,000.* Good overhead ratios. Fully computerized practice with excellent business systems in effect. Solid, long-term team in place dedicated to a successful transition.

This practice is priced to sell. Due to the financial strength of this practice, extensive financing is available. The present owners are relocating. Serious inquiries reply in confidence to **CDA ACCESS Box 2604.** (12/02)

**PRACTICE FOR SALE
Thunder Bay - Ontario**

High grossing, high profile mall practice in Thunder Bay, four ops, modern equipment, pan etc. 2,000 sq. ft., attractively designed offices. Owner leaving for health reasons. **Contact Dental Consulting Services (807) 345-2236.** (10/02)

QUEBEC - Hull West: General practice for sale, busy, well-established, computerized, modern equipment, three operatories, 1,800 sq. ft. country dental office, 15 minutes from downtown Ottawa. Yearly gross approximately \$500,000. Owner will assist in transition. Write to CDA ACCESS Box 2605 or call (819) 456-3853, ask for Julia or Michele. (12/02)

NOVA SCOTIA - Halifax: For Sale - Well established family practice located in historic Hydrostone market, computerized, efficient Kavo equipment and excellent growth potential. Contact Bill Tingley at (902) 835-1103. (11/13)

NOVA SCOTIA - Halifax Region: Dalhousie graduate with four years experience in general practice seeking to purchase/associate with option to buy practice within one hour of Halifax, NS. Please reply to CDA ACCESS Box 2613 or phone (902) 765-8995. (01/03)

NOVA SCOTIA - Annapolis Valley: Practice for sale in Nova Scotia Annapolis Valley. Very busy family practice, 1,200 sq. ft. office in a medical/dental professional centre. Ultra-modern dental set-up, good gross, priced to sell. For more information call (902) 245-5666. (04/13)

Positions Available/Sought

BRITISH COLUMBIA - Vancouver Associate wanted with potential for partnership. Office affords a panoramic view of the sea and mountains in the Vancouver, B.C., area. Immediate opening. Please reply to CDA ACCESS Box 2606. (12/02)

BRITISH COLUMBIA - Vancouver Island: Wanted - Associate, or become a partner in a well-established, busy group practice in Duncan. Excellent new patient flow, strong recall/hygiene program, great staff, including hygienists. Please call (604)

748-6766 evenings or write to CDA ACCESS Box 2607. (12/02)

BRITISH COLUMBIA - VICTORIA

Associate wanted for progressive family strip mall practice in established residential area of city. Owner wishes to extend hours to evenings and weekends (Friday, Saturdays, and possibly Sundays) and seeks individual who is willing to cover this time. There is potential for a future partnership. Our main concern is quality care. If you are interested please call (604) 595-3345. (02/04)

BRITISH COLUMBIA - Nanaimo: Excellent opportunity for an associate/partnership in the "Hub City" of Vancouver Island. Nanaimo is experiencing fantastic growth. A fabulous lifestyle (world-class fishing, hiking, windsurfing - you name it), and still reasonable real estate prices. If your future is important to you, call (604) 756-1200 (day), (604) 756-1082 (eve). (11/02)

**BRITISH COLUMBIA - Williams Lake
Proven Performer!**

AVAILABLE SUMMER 1994

Enthusiastic associate can easily earn a six figure income in my large family practice. Well organized computerized office with three full-time hygienists, office manager and visiting oral surgeon and anesthesiologist. Excellent 13-year earning track record for previous associates.

Call **Alistair Menzies collect in Williams Lake, B.C.**

(604) 398-7161 (O), (604) 392-2615 (H), (604) 398-8633 (Fax).

This is a place to get both good experience and a good income. (10/02)

LOCUM LOCATORS

COLLECT (403) 791-7737.

(07/13)

ALBERTA-CALGARY

Associate Wanted:

Presently seeking motivated associate. Opportunity to develop a practice in a progressive computerized high-volume downtown practice in Calgary. Please reply to CDA ACCESS Box #2615. (02/02)

SASKATCHEWAN - Regina: Seeking dental associate for modern office in large medical/dental facility. Good opportunity for the right person. For details call Dr. Ronald Katz, (306)

924-1494, or write to: 235B Albert Street N., Regina, Saskatchewan S4R 3C2. (08/13)

SASKATCHEWAN - Rosetown: Excellent opportunity for a full-time associate to work with a well-established practice, half-time in Rosetown and half-time at a satellite practice in Eston. If you are a highly motivated dentist looking to work in a progressive environment (fully computerized, highly-trained team members...) away from the city (yet easily accessible to Saskatoon), we would like to hear from you. Buy-in potential exists for the right candidate. Please contact Dr. Glenn Riekman, Box 1690, Rosetown, SK, S0L 2V0. Phone: office (306) 882-2123 or home (306) 882-2006. (02/04)

YUKON TERRITORY - Whitehorse: One-third interest in long-standing group practice. Opportunity to associate for a few months to see and experience the practice. For further information contact Dr. C.R. Pugh, 50 Firth Road, Whitehorse, Yukon Y1A 4R6 (403) 667-2489, (403) 667-4486. (11/02)

**PERIODONTIA PRACTICE -
Associate/Buy-in**

Long established practice in Southern Ontario's fast growing Golden Horseshoe offers a terrific opportunity for an individual to step into a very busy practice that features new equipment, great staff and full implant services. Can start immediately. Purchase opportunity now or in future. To learn more please call (905) 525-3040. (02/04)

ONTARIO - KITCHENER, WATERLOO

Pediatric dentist, full- or part-time associate wanted for busy children's practice in Kitchener. Hospital privileges available. Future partnership possible. Contact Dr. Graham Brydges, office (519) 576-8510 or home (519) 743-7953. (12/02)

ONTARIO - PETERBOROUGH

Full-time associateship available immediately. We are seeking a highly motivated individual to join our dental team. We have a group practice with a friendly, hard-working support staff. The practice is fully computerized with modern equipment. Patient flow is excellent and we practise in all areas of dentistry. Peterborough is a friendly sports-minded community located in the beautiful Kawartha lake district. We are seeking an individual with long-term interest. Call daytime (705) 749-0133, evening (705) 745-9632. (11/02)

DALHOUSIE UNIVERSITY - FACULTY OF DENTISTRY

Associate Dean For Academic Affairs

Applications and nominations are invited from individuals for the position of Associate Dean for Academic Affairs. The Associate Dean is expected to demonstrate academic leadership to the faculty in the areas of teaching, scholarly activity and service. The Associate Dean will be responsible for the planning, implementation, and quality control of the academic programs of the Faculty. Candidates must be qualified for Faculty appointment and tenure. Applicants should possess academic administrative experience, strong interpersonal skills, have knowledge of dental and dental hygiene curricula, and have expertise in evaluation, remediation and outcomes assessment methods.

The Faculty of Dentistry is made up of five departments and a School of Dental Hygiene. The entering class for 1993 was 32 undergraduate dental and 40 dental hygiene students. The Faculty also offers graduate education in Oral and Maxillofacial Surgery. The Faculty has affiliation agreements with Halifax teaching hospitals, the Canadian Armed Forces Hospital Stadacona and the Grenfell Regional Health Services. Pediatric and geriatric dental care are provided at two off-campus satellite locations and an externship program is offered in Newfoundland.

Dalhousie University is an Employment Equity/Affirmative Action Employer. The University encourages applications from qualified women, aboriginal peoples, visible minorities and persons with disabilities.

In accordance with Canadian immigration requirements, this advertisement is directed in the first instance to Canadian citizens and permanent residents.

Salary and rank will be commensurate with credentials and experience. All replies will be treated with confidence. Qualified candidates should submit their application, a curriculum vitae, and the names of three referees to the Chair, Search Committee for Associate Dean of Academic Affairs. Preference will be given to applications submitted by March 31, 1994, at the address below.

Dr. R. Goodday, Chair
Search Committee for Associate Dean for Academic Affairs
Faculty of Dentistry, Dalhousie University
Halifax, Nova Scotia
B3H 3J5

(01/02)

THE SIR MORTIMER B. DAVIS - JEWISH GENERAL HOSPITAL

PROSTHODONTIST

The Sir Mortimer B. Davis-Jewish General Hospital (S.M.B.D.-J.G.H.), Department of Dentistry, is seeking a prosthodontist for the position of geographic full-time (GFT) dentist commencing July 1, 1994. The S.M.B.D.-J.G.H. is a McGill University teaching hospital. Successful candidates will be conferred joint appointments to the hospital staff and the academic staff of the Faculty of Dentistry at McGill University.

Applicants must have at least three years experience in hospital or private practice in prosthodontics and be eligible for licensure in the Province of Quebec. A working knowledge of French is essential. Responsibilities will include postgraduate teaching and coordination of academic staff in the division of prosthodontics, as well as research.

In accordance with Canadian immigration requirements, this advertisement is directed to Canadian citizens and permanent residents of Canada. Applications will be considered until March 31st, 1994 or until the position has been filled and should be sent to the following address accompanied by a detailed curriculum vitae and the names and addresses of two referees:

Dr. Mervyn Gornitsky
Chief, Department of Dentistry
Sir Mortimer B. Davis-Jewish General Hospital
5750 Cote des Neiges
Montreal, Quebec
H3S 1Y9

(12/02)

To place

your

CDA
ACCESS
AD

just call

Neil McGillivray

at

(905) 278-6700

(Toronto Area)

or

(800) 661-5004.

ONTARIO - Niagara-on-the-Lake

Associate Wanted: Our office, focusing on a high level of patient care and concern, is looking for an associate. The ideal candidate could be semi-retired from a successful and competent practice, wishing to work three to four days per week, at a relaxed pace, focusing on patient diagnosis, communications and some clinical care. **Please contact**

Anne, Monday to Thursday at
(905) 468-2128. (01/03)

ONTARIO - Toronto: Orthodontist available, young female orthodontist with experience is seeking employment as an associate/partner in Toronto area. Excellent references, contact "Dr. G." (613) 735-3649 or (613) 687-7416. (02/03)

NEWFOUNDLAND - Baie Verte: Busy three-chair computerized clinic. 3,000 active patients, drawing from population of 10,000. Part-time associate available. Owner leaving area in '94. Two to three years left on equipment/computer leases. Asking \$60,000. Call Rob or Gillian (709) 532-8014 (office) or (709) 532-4601 (home). (01/03)

Meetings & Announcements

MAY 27th - JUNE 1st 1994

ALBERTA DENTAL ASSOCIATION PROVINCIAL DENTAL MEETING

will be held at the Banff Springs Hotel in
Banff, Alberta. For registration or
information contact :

**Dr. B. Yaholnitsky, 370 - 202 - 6 Avenue
S.W., Calgary, Alberta, T2P 2R9 (11/05)**

THE 18TH ANNUAL FLORIDA MEDICAL, DENTAL, LEGAL AND PODIATRIC SEMINAR

Place - Embassy Suites Hotel
Boca Raton, Florida

Dates - March 28, 1994 - April 9, 1994

Sponsored by:

The Florida Health Seminars

*15 hours of continuing dental education
credits available.*

For information please contact

**Linda Golnick, 4826 Cliffside Drive,
West Bloomfield, Michigan 48323 U.S.A.
(810) 681-0211**

Book early to avoid disappointment. (01/02)

Equipment Sales, Service

NOVA SCOTIA - Halifax: For Sale -
Dental EZ J.S.R. chair, adtec traytrol
(chair) MT bracket, Peri-pro devel-
oper, BDM1 vibrator, Kodak safe-
light, MC #3 cabinet, Dentech 700
control. Contact Dr. Paul Bonazza at
(902) 465-4210 or home (902) 466-
5484. (02/04)

DENTAL EQUIPMENT REPAIR

- Handpieces, low and highspeed
Send your damaged handpieces
(sterilized) to

A.S.A.P. Dental Services

29 Dignard Street
Embrun (Ottawa) Ontario
K0A 1W1

FREE ESTIMATIONS

Call (613) 443-0087 (01/02)

ONTARIO - Toronto: ELVIS LIVES!!!
A fully-functional dental office, lab,
artifacts and supplies from the '50s
for sale. (705) 687-4545. (12/02)

DANSEREAU HEALTH PRODUCTS CLINIC II

California Chair

All electric, auto return. Reversible cushions, choice of 30 colors.

Delivery System

3-Handpiece automatic foot control, air lock arm, stainless steel tray,
3-Way syringe, X-ray view box.

Assistants Package

HVE, saliva ejector, 3-way syringe, cuspidor, manual cup filler, quick
disconnect, J-box with controls for easy installation.

Light

Chair mounted light, post plate and cup.

Retail \$5,325. With Cash Discount \$3,995.

We accept Visa & MasterCard.

All prices FOB factory Anaheim.

Manufacturer direct sales for 31 years.

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(714) 776-5357 FAX (714) 776-4652

(800) 561-3177 (USA & Canada)

DANSEREAU HEALTH PRODUCTS CANADA

800 Burrard Street, Vancouver

(604) 941-6799



ND: YAG LASER

For Sale - \$28,000

New, Excellent Price

Call Daniel Menard (514) 682-2861 or
write Distributions Biodent - 400, boulevard
Cure-Labelle, Bureau 450
Laval, Quebec H7V 2S7 (01/03)

Miscellaneous

FINE ART PRINTS - FOR SALE

The Black Rhino by John Filipchuk, a limited edi-
tion of 250 hand-printed, silk screen prints in 32
colours, 24" x 36" signed & numbered. Regular
price \$650.00. Until March 30, 1994 - \$450.00 +
taxes prepaid. Brochure \$2.00. **Del Bello Gallery**
363 Queen St. W., Toronto, Ontario M5V 2A4
Tel.: (416) 593-0884 Fax: (416) 593-8729 (01/02)

LEGAL SERVICES FOR DENTISTS

Re: Buying or Selling a Dental Practice,
Associate Agreements, Leases and
other Professional matters.

Dr. Rollin M. Matsui B.Sc., D.D.S., LL.B.

Lawyer and Dentist

Toronto (416) 593-9776

Fax (416) 979-0430 (01/02)

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(800) 661-5004

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10 GOOD REASONS WHY YOU SHOULD REGISTER (EARLY) FOR THE FDI CONGRESS —



Enjoy the most comprehensive scientific program ever assembled for an FDI Congress.



Combine a vacation with the FDI Congress. Take the opportunity to savour the beauty of Western Canada's unspoiled scenery.



Attend just ONE convention and have access to many different lectures, hands-on courses and live television presentations.



Meet your colleagues from the world over.



Learn new techniques that you can apply immediately upon your return to the office.



Qualify for the car draw and for other on-site draws.



Fulfil your continuing education credit needs. We will provide proof of attendance for every lecture you attend.



Pre-register before May 15, 1994 and pay a reduced registration fee.



Take advantage of programs designed not only for yourself but for your family and your entire dental team.



The latest products and technological developments will be on display in the exhibit hall and will be yours to discover!

WORLD FOCUS ON ORAL HEALTH
FDI
1994

82nd World Dental Congress
VANCOUVER, CANADA
Oct. 2-8, 1994

32ND WORLD DENTAL CONGRESS • VANCOUVER OCTOBER 2ND TO 8TH, 1994

UPDATE • UPDATE • UPDATE • UPDATE • UPDATE

Table Clinics, Free Communications and Poster Presentations: A Vital Part of the Scientific Program



The most comprehensive scientific program ever has been assembled for the **1994 FDI World Dental Congress** which will be taking place in Vancouver, Canada from **October 2nd to 8th, 1994**. A vital part of this scientific program are the table clinics, free communications and poster presentations.

Presenting a table clinic, free communication or poster presentation is a rewarding way for clinicians to share their knowledge, research and their own personal experience on a specific topic of interest or concern to the dental profession in a condensed manner. This section of the Congress will be a great experience for both the presenters and the observers as information is shared between the various international dental communities.

Those interested in presenting a table clinic, free communication or poster presentation will need to send in Enrolment Form B along with their FDI Congress registration. Enrolment Form B is attached to the participant enrolment forms found in the centre pages of the Preliminary Program or can be obtained by calling the FDI 1994 Organizing Committee at 1-800-267-6354.

Along with their entry form a clinician will need to submit an abstract of their presentation. This abstract will be reviewed by the Organizing Committee and will be the basis upon which the selection process is made. The abstract should clearly explain the purpose of the presentation or demonstration or poster and give a description of what will be presented. It will also outline what the average practitioner watching the demonstration will learn and take back to his/her practice.

All clinicians sending in their applications must be registered for the Congress in order to be considered for selection. Entry forms must arrive at the FDI 1994 Organizing Committee in Ottawa no later than April 1st, 1994.

This year Unilever Research will be sponsoring a contest for all table clinic entries. First prize is US\$3,000 and a solid silver salver. Second prize is US\$2,000. Third prize is US\$1,000. So, don't delay, send in your applications today!

In addition to the general scientific program many hands-on courses, limited attendance sessions and live television presentations will also be offered. While these lectures will be available to all dental professionals registered for the Congress, they have size capacity limitations and will be based on a first-come, first-served basis.

Accreditation will be given to participants for all scientific lectures attended. One credit will be given per hour spent in lectures. Proof of attendance would then be sent in to the participants' crediting body with whom they are registered.

The scientific program will be an invaluable part of the Congress and has been designed to meet the needs of all dental professionals. To avoid disappointment, send in your enrolment forms today!

Michel Jahjah, D.D.S.
General Chairman
FDI 1994 Organizing Committee
c/o Canadian Dental Association
1815 Alta Vista Drive
Ottawa, Ontario K1G 3Y6

Tel.: 1-800-267-6354
Fax: (613) 523-3062



FDI 1994 CONGRESS-AT-A-GLANCE

OCTOBER 2 SUNDAY	OCTOBER 3 MONDAY	OCTOBER 4 TUESDAY	OCTOBER 5 WEDNESDAY	OCTOBER 6 THURSDAY	OCTOBER 7 FRIDAY	OCTOBER 8 SATURDAY
PRE-CONVENTION COURSES (LIMITED ATTENDANCE)		LECTURES, LIVE TV PRESENTATIONS, HANDS-ON COURSES, POSTER PRESENTATIONS AND TABLE CLINICS FOR DENTISTS, ASSISTANTS, HYGIENISTS, TECHNICIANS AND OFFICE PERSONNEL				POST- CONVENTION
	OPENING CEREMONY	DENTAL TRADE EXHIBITION				
DINNER CRUISE	INTERNATIONAL EVENING	CHINESE EVENING	SALMON BARBECUE	FDI BALL		
	VISITS AND ONE DAY TOURS, ACCOMPANYING PERSONS' PROGRAM, CHILDREN'S PROGRAM					TOUR
PRE- CONGRESS TOURS	FDI BUSINESS MEETINGS FROM SEPTEMBER 29TH TO OCTOBER 8TH					POST- CONGRESS TOURS



SPECIAL ACTIVITIES



GOLF DAY

Wednesday, October 5

Golfing enthusiasts — this is your day!

Take part in the FDI golf tournament which will be held at one of Vancouver's numerous, lush golf courses. It will be a shotgun start. **Register today for this event!** Due to space limitations, only 140 golfers will be registered on a first-come, first-served basis.

A golf shop will be available for rental of golf clubs and other standard equipment. The registration fee includes transportation to the golf course as well as a meal.



FUN RUN & WALK

Thursday, October 6

07:00 - 09:00

Join your fellow international runners in a 5 kilometer run or walk or a 10 kilometer run along the Sea Wall of Vancouver's famous Stanley Park, located near the downtown area.

Awards will be given to the winners of the competition but ... if you prefer to savour the scenic trails, you may run or walk at your own speed!

The registration fee includes transportation from the Convention Centre to Stanley Park, a limited edition T-shirt, a snack and a beverage.

LIMITED ATTENDANCE COURSES



STANLEY MALAMED (USA)

**"Pain and Fear and
the Future of Dentistry"**

Sunday, October 2 • All-day lecture, presented in English

The management of pain and anxiety form the backbone of contemporary dental practice. The past decades have seen the introduction of a significant number of promising new techniques, drugs and equipment designed to aid the dental professional in a quest for a more pain-free and fear-free dental practice. In this program, the lecturer will discuss these advances, with an eye towards their possible applications in dentistry. Included will be a discussion of the relatively new technique of electronic dental anesthesia (EDA).



CLYDE SCHULTZ (USA)

**"Recession Proof Your Practice: Strategies for
Minimizing the Effects of Economic Downturn"**

Sunday, October 2 • All-day lecture, presented in English

The objective of this program is to teach survival strategies for hard times. This includes advice on what to do and not to do in your office, with emphasis on positive techniques and effective strategies for dealing with patients, insurance problems, and communication with your staff.

Topics include: Recession proof the demand in your practice through powerful team communication techniques; Build trust and reduce stress as you show patients you share their goals for treatment; Never worry about filling your appointment book again!



ROY PAGE (USA)

**"Periodontics for the 1990's
and Beyond"**

Monday, October 3 • All-day lecture, presented in English

The goal of this program is to summarize the major developments that have occurred in periodontics and periodontology over the past decade, and to project developments likely to occur in the immediate future. New approaches to treatment of the various kinds of periodontitis will be described and illustrated.



RONALD FEINMAN (USA)

**"Aesthetic Restorative Procedures,
How, When and Why?"**

Sunday, October 2 • All-day lecture, presented in English

This program will broaden the dentist's horizon in practicing dentistry as it explores a complete gamut of restorative dentistry today. Subjects will include porcelain veneers, bleaching teeth (office and home), direct and indirect composite systems, glass ionomers and cements, current retraction techniques, resin-bonded bridges and cosmetic tissue relationships. Eliminate the confusion by learning what, when, where and how to use.



TERRY DONOVAN (USA)

**"Aesthetic Restorative Dentistry and
Materials Update"**

Monday, October 3 • All-day lecture, presented in English

There is a host of options for the contemporary dentist in treating patients interested in esthetic dentistry. Many of these are less invasive than many of our conventional restorative therapies.

This presentation will delineate the procedures necessary for success with conventional and contemporary adhesive restorative dentistry. Many of the newer products will be evaluated and compared; emphasis will be on clinical product manipulation. Topics to be covered include: Effective gingival displacement; Impression materials: techniques for use; Solutions for fractured porcelain; bleaching, enamel micro-abrasion; bonded porcelain (veneers, crowns, inlays, onlays).

All-day Limited Attendance Courses allow the speaker to spend more time on antecedents, discuss different treatment procedures and thoroughly review specific cases. The participants benefit immensely from this sustained lecturing in a single field of dentistry. The number of participants will be restricted by room capacity.



HANDS-ON COURSES



GLEN MCGIVNEY (USA)

"Removable Partial Denture"

Monday, October 3

All-day participation course, presented in English

This hands-on course will provide the participant with the skills necessary to fabricate a well-fitting, esthetic and functioning removable partial prosthesis.

The course will cover:

1. The common causes of failure of partial dentures,
2. Treatment planning,
3. A systematic approach to design, and
4. Simulated intra-oral tooth preparation, surveyor use and actual design.



ALAN BOGHOSIAN (USA)

"Dental Materials for Dental Assistants"

Tuesday, October 4

A.M. participation course, presented in English

The continuous development and evolution of dental materials have greatly contributed to improvement in the restoration and preservation of natural tooth structure. Restorative modalities exist today that were not deemed possible a decade ago.

This lecture and participation course will discuss properties and allow for the hands-on mixing and manipulation of traditional and recently introduced dental materials. Participants will have the opportunity to handle several categories of dental materials including cements, impression materials and light cured restoratives. This course will emphasize techniques to maximize the physical properties of the material while allowing for modification of handling properties such as work and setting times.



ST. JOHN'S AMBULANCE (CANADA)

"Cardio-pulmonary Resuscitation"

Tuesday, October 4

All-day participation course, presented in English

Wednesday, October 5 (repeat)

Thursday, October 6 (repeat)

The C.P.R. Level 'C' course meets Canadian Heart Foundation standards. This five to six hour course is designed for Health Care Professionals. It offers one and two operator C.P.R. for the adult, as well as child and infant resuscitation and obstructed airway procedures for adult, child and infant. Certification is recommended to be renewed yearly.



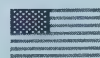
PAT ROBERTSON ET AL (CANADA)

"Dental Radiography"

Tuesday, October 4

A.M. participation course, presented in English

Are your patients receiving the maximum diagnostic information for the minimum exposure to radiation? This program is designed for Certified Dental Assistants and Dental Hygienists with some experience in taking dental radiographs. Practical sessions with mannequins will involve small group demonstrations and discussion on bite-wing technique, endodontic radiography and troubleshooting difficult film placements.



HERBERT BADER (USA)

**"Root Planing and Scaling:
Evolution or Revolution"**

Tuesday, October 4

A.M. participation course, presented in English

The most difficult and critical modality or therapy in dentistry is scaling and root planing. This hands-on course covers the in-depth use of ultrasonic instrumentation. The participant will be exposed to the theory and practice of ultrasonics and be given an opportunity to utilize the latest in piezo electric instrumentation on a typodont.

The attendee will receive a complete overview of the field with an excellent skill enhancement opportunity to become familiar with the most current and exciting techniques.



SHERRY BURNS &

NANCY KNISPEL (USA)

**"Isn't It About Time to Get on the Cutting Edge?
The Care, Maintenance and Sharpening of
Periodontal Instruments"**

Wednesday, October 5

A.M. participation course, presented in English

This new and innovative technique for learning instrument sharpening will have you on the cutting edge in no time. And sharp instruments mean higher productivity, longer instrument life and greater effectiveness.

This HALF DAY workshop includes lecture, demonstration and practice of instrument sharpening for sickle scalers and curette. This new approach to instrument sharpening makes it easy to learn and to apply. A sharpening kit will be available for purchase.

HANDS-ON COURSES



Howard Martin (USA)

"Endodontics for the '90s - Flare, File, Fill"

Wednesday, October 5

All-day participation course, presented in English

This participation course will increase your clinical experience in technological advances to quickly improve your success and do more endodontics with ease, effectiveness and efficiency.

1. Utilizing ultrasonic biotechnological root canal preparation (Caviendo).
2. The warm lateral condensation technique (Endotec).
3. Control safe end K/H file and handle.



KEITH ROSSEIN (USA)

**"Provisional Restorations:
Two User Friendly Restorative Techniques"**

Wednesday, October 5

A.M. participation course, presented in English

This is a hands-on workshop that will provide participants with two restorative techniques that can be immediately implemented in everyday practice. Using periodontal "splinting bars", participants will construct an "embedded bar bridge". This is a quick, permanent alternative to the traditional bridge, especially in today's economy.

In the second part, participants will construct high quality provisional bridges utilizing the Press Form Technique. This procedure will drastically reduce the amount of time needed to be scheduled for crown & bridge appointments and will minimize patient return-for-repair visits. All participants will leave with professional study models that are ideal for patient case presentation.



**SHERRY BURNS &
NANCY KNISPEL (USA)**

**"How to Choose and How to Use the
Newest Curettes – Periodontal
Instrumentation Workshop"**

Wednesday, October 5

P.M. participation course, presented in English

This workshop will provide an opportunity for hands-on exercises using After Five, Mini Five, Langer and Rigid Series curettes. Practice will be accomplished using typodont models and extracted teeth. Strategies for developing instrument set-ups will also be presented.



TED DEVRIES (CANADA)

"Computers - Up Close and Personal"

Thursday, October 6

All-day participation course, presented in English

This session will give participants an opportunity to gain hands-on experience with various aspects of today's complete computer solutions. Demonstrations will cover basic components of the computer, the highly popular windows environment and a detailed look at a complete dental management system. The wide array of features that are incorporated in the dental software will be explained and left for you to experiment with.



**MICHAEL GOLDFOGEL &
ALLEN KINCHELOE (USA)**

"Esthetic Dentistry 1994"

Thursday, October 6

All-day participation course, presented in English

This course is a full day course combining 1/2 day lecture with a 1/2 day hands on experience in a laboratory setting. The morning lecture serves as a didactic presentation showing step by step esthetic dental techniques. The participation reinforces the lecture material and allows the practitioner to use the most modern dental esthetic materials.

Topics to be included in this presentation are:

1. Most recent advances in esthetic materials,
2. Free hand veneering,
3. Diastema closure,
4. Porcelain veneers,
5. Masking discoloured teeth, and
6. Understanding of colour.



JEFFREY SHERMAN (USA)

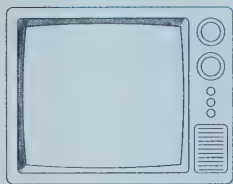
"Dental Electrosurgery for the 90's"

Thursday, October 6

A.M. participation course, presented in English

Electrosurgical techniques are truly designed for the modern practice of dentistry. Electrosurgery, with its assortment of electrode tips, permits carving, sculpturing, or altering of soft tissue with little or no hemorrhage.

This course includes a complete discussion and demonstration of all electrosurgical cutting, coagulation, and fulguration modes on the latest electrosurgical equipment. The participants will have the opportunity to practice the various types of procedures including frenectomy, operculectomy, crown preparation and biopsy under the supervision of the clinician.

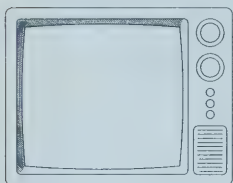


**STEPHEN LEWIS (USA) &
PETER STEVENSON-MOORE
(CANADA)**

**"Osseointegrated Implants for the
Partially Edentulous Patient"**

*Wednesday, October 5 • A.M. presentation in English
Simultaneous interpretation into French,
German and Spanish*

Due to the overwhelming success of osseointegrated implants in edentulous patients it seemed only reasonable to apply osseointegration to the partially edentulous patient population as well. One major concern was that of esthetics, the ability to fabricate restorations which appear as natural teeth emerging through the mucosa. This live television presentation will demonstrate on a patient the implant components, techniques, and surgical/restorative interactions in order to achieve successful esthetic restorations for the partially edentulous patient.



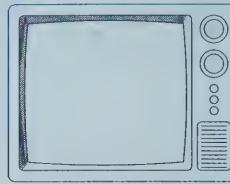
TERRY DONOVAN (USA)
"Porcelain Veneering Made Easy"

*Wednesday, October 5 • P.M. presentation in English
Simultaneous interpretation into French,
German and Spanish*

The popularity of porcelain veneers in the dental office is ever increasing due to patient awareness and demand. If success is to be achieved in creating porcelain veneers that truly reflect natural teeth, the dentist and the other members of the dental team must coordinate their efforts. This live television presentation will show all procedures leading to a successful preparation of porcelain veneers. All steps including treatment planning, tooth preparation, taking of impressions as well as cementation will be demonstrated live on a patient.

Live television presentations will constitute a vital part of the Congress. General practitioners will benefit from illustrations by skilled clinicians demonstrating new techniques and diverse procedures. Demonstrations will be shown live via giant screen TV. Participants will have an opportunity to ask questions to the clinician as he performs procedures on patients.

* Other presentations will be available during the Congress.

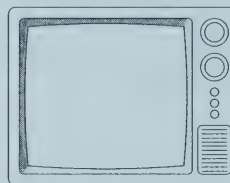


"Guided Tissue Regeneration"

*Thursday, October 6 • A.M. presentation in English
Simultaneous interpretation into French,
German, Japanese and Spanish*

Guided tissue regeneration offers the clinician a technique which has the potential to restore supporting tissues lost as a result of periodontal diseases. The technique relies on the use of physical barriers to exclude gingival epithelium and connective tissue from healing wound.

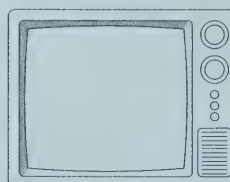
The demonstration will clearly show flap design, incisions, defect and root debridement and membrane placement. We will demonstrate adaptation and wound closure. Post-operative instructions and time for membrane removal will be discussed.



**WERNER MORMANN
(SWITZERLAND)**
**"Computer-aided Direct
Ceramic Restorations"**

*Thursday, October 6 • Noon presentation in English
Simultaneous interpretation into French, German,
Japanese and Spanish*

The clinician will perform a restorative procedure on a live patient using a chair-side computer-aided design and manufacturing technique for producing ceramic inlays, onlays and veneer laminates. Additional presentation, reservation on-site.



HERBERT BADER (USA)
**"Hand and Powered Root Instru-
mentation: The Heart and Soul
of Periodontal Therapy"**

*Thursday, October 6 • P.M. presentation in English
Simultaneous interpretation into French, German,
Japanese and Spanish*

Successful management of the periodontal patient begins and ends with control of the root surface environment. This program addresses that issue with benchtop and live patient demonstration of the most current techniques and instruments to achieve a root surface compatible with biologic health. The attendee will become familiar with the new generation of hand instruments and ultrasonic systems, including a discussion and demonstration of the effects of antimicrobial lavage with ultrasonic scalers.

FDI '94 PRE AND POST CONGRESS TOURS



ALASKA (September 24 - October 1, 1994)



A memorable 7 night cruise to Alaska aboard Holland America's M.S. Westerdam. Heading up the inside passage, enjoy many delightful ports of Ketchikan (Alaska's first city), Juneau (Alaska's capital) and Glacier Bay (where the mighty glaciers will take your breath away!). A trip of a lifetime!

CANADIAN ROCKY MOUNTAINS (October 8 - 11, 1994)



See the wonders of the Canadian Rocky Mountains on this 4 day/3 night train and bus excursion. Travel through spectacular scenery during the day and enjoy comfortable hotel accommodations at night. You will see a wide variety of wildlife and natural attractions that Alberta and British Columbia have to offer; including the wonderful destinations of Jasper, Banff and Lake Louise.

HAWAII (October 7 - 14, 1994)



Enjoy a fabulous 8 day/7 night vacation in Hawaii on the island of Oahu. You can stay at the Hilton Hawaiian Village or at the Pacific Beach Hotel, both situated on the beautiful Waikiki beach. A perfect tour for those wishing to relax and enjoy the magnificent view of Hawaii.

LOS ANGELES (October 10 - 13, 1994)



Enjoy a marvelous 4 day/3 night cruise aboard Holland America's M.S. Westerdam from Vancouver to Los Angeles along the Canadian and U.S. coast. Since the cruise departs on October 10th, this is the perfect tour for those wishing to do some post-conference sightseeing in Vancouver.

AUSTRALIA AND NEW ZEALAND (October 7 - 21, 1994)



An incredible 15 day/14 night post-conference tour "down-under". In Australia, visit Cairns, the great Barrier Reef, the rain forests, Sydney, the Blue Mountains and go on a wine tour. In New Zealand, see the Coromandel Peninsula and Rotorua thermal springs. You will also have the opportunity to stay either on a sheep, kiwi fruit or cattle farm for two nights. Each farm will host 2 couples from our group – a sure way to enjoy local New Zealand hospitality. From here, optional stopovers for 4 days/3 nights in either Fiji or Hawaii.

For more detailed information,
contact the FDI 1994 Organizing Committee
at 1-800-267-6354 by telephone or at (613) 523-3062 by fax.

ANNOUNCEMENTS

National Highlights

April 21-23
Ontario Dental Association
Annual Spring Meeting
 (416) 922-3900, ext. 352

May 12-14
Newfoundland Dental Association Annual Convention
 (709) 579-2362

May 28-June 1
23e Congrès annuel de l'Ordre des dentistes du Québec, Les journées dentaires du Québec
 (514) 875-8511
 Fax: (514) 875-1561

October 2-8
Joint CDA/FDI Annual Dental Meeting, Vancouver, BC
 (613) 523-1770,
 or 1-800-267-6354

March/Mars 1994

March 3-5: Academy of Osseointegration Ninth Annual Meeting in Orlando, Florida. For information, contact: Academy of Osseointegration, 401 N. Michigan Ave., Chicago, Illinois 60611-4267.

March 19: Dr. John Kanca, Adhesion Dentistry State of the Art '94, a course presented by the Alberta Chapter of the Academy of General Dentistry at the Delta Bow Valley Inn, Calgary, Alberta. To register, phone (403) 278-1421, or fax (403) 271-2903.

March 19-26: 33rd International Alpine Dental Conference being held at the Hotel Annapurna, Courchevel, France. For details, contact: International Dental Foundation, 53 Sloane St., London, England, SW1X 9SW.

March 29-April 1: 91st Scientific Session of the Hawaii Dental Association, in Honolulu, Hawaii. For information, contact: Mr. Danny Park, executive director, Hawaii Dental Association, 1000 Bishop St., Suite 805, Honolulu, Hawaii, 96813. Tel: (808) 536-2135.

April/Avril 1994

April 1: Call for abstracts from the American Association of Public Health Dentistry for papers on a broad range of dental health topics for presentation at their 57th Annual Meeting, Oct. 19-21, 1994, in New Orleans, La. The theme of this year's meeting is "Ensuring the Future: Oral Health For All." Deadline for abstract submission: April 1, 1994. For information, contact: Dr. Dennis H. Leverett, Acting Director, Eastman Dental Center, 625 Elmwood Avenue, Rochester, N.Y. 14620. Tel: (716) 275-5001 or (716) 273-1081.

April 8-9: Southern Ontario Surgical Orthodontic Study Group meeting in Windsor, Ontario. For details, contact: Dr. Jeff Berger (519) 258-2632, or fax: (519) 258-2637.

April 20-24: Annual International Educational Seminar of the American Academy of Cosmetic Dentistry, in Phoenix, Arizona. For information, contact: Ms. Maureen Steckman, executive director, AACD, 2711 Marshall Court, Madison, Wisconsin, 53705.

April 21-24: Irish Dental Association Annual Scientific Conference, in Waterford City, Ireland. For further details, contact: Ms. Margaret Ferguson, Irish Dental Association, 10, Richview Office Park, Clonskeagh Rd., Dublin, 14.

April 21-23: British Dental Trade Association Dental Exhibition, at the NEC Birmingham. For information, contact: The British Dental Trade Association, 84 High St., Slough, Berks SL1 1EL, UK.

April 24-26: Joint meeting of the Canadian Academy of Endodontics & Australian Society of Endodontology at the Maui Inter-Continental Wailea Hotel in Maui, Hawaii. For information, contact: Dr. Wayne Pulver, President, Canadian Academy of Endodontics, 159 Willowdale Ave., Willowdale, Ontario M2N 4Y7. Tel: (416) 222-9900.

April 27-May 1: 51st Annual Session of the American Association of Endodontists (AAE) at the Hilton Hawaiian Village in Honolulu, Hawaii. To register, contact: American Association of Endodontists, Annual Session Registration, 211 E. Chicago Avenue, Chicago, Illinois 60611-2691. Tel: (312) 266-7255.

May/Mai 1994

May 14: Alberta Academy of Periodontology is holding a continuing education course entitled Current Concepts in Periodontics. For further information contact: Dr. Albert Frydman, (403) 288-3334.

May 22-28: International College of Dentists Annual Meeting-European Section at the Jerusalem Hilton Hotel in Jerusalem. For details, contact: Dr. S. Sussman, Secretariat, ICD European Section, P.O. Box 50006, Tel Aviv 61500, Israel.

June/Juin 1994

June 2-4: Academy for Sports Dentistry Meeting in Pittsburgh, Pennsylvania. For information, contact: Dr. A.W.S. Wood, 1553 Randor Dr., Mississauga, Ontario L5J 3C6. Tel: (905) 823-2008.

June 6-10: 12th National Congress on Dentistry (Latin-American Meeting on Dentistry) at the Havana International Conference Center in Havana, Cuba. For more information, write: Palacio de las Convenciones, Apartado 16046. La Habana, Cuba.

June 6-17: Pindborg Course in Oral Pathology will be given on the premises of the Danish Dental Association in Copenhagen, Denmark. For more information, contact: Anne Grethe Ingversen, Secretary, Dept. of Oral Pathology, School of Dentistry, University of Copenhagen, 20 Norre Allé, DK-2200 Copenhagen N, Denmark.

June 20-26: Expodental 94 - Turkish Dental Association Second International Dental Congress in Istanbul, Turkey. For information, contact: Istanbul Chamber of Dentists, Mesrutiyet Cad. 182/7 Sishane, Istanbul, Turkey.

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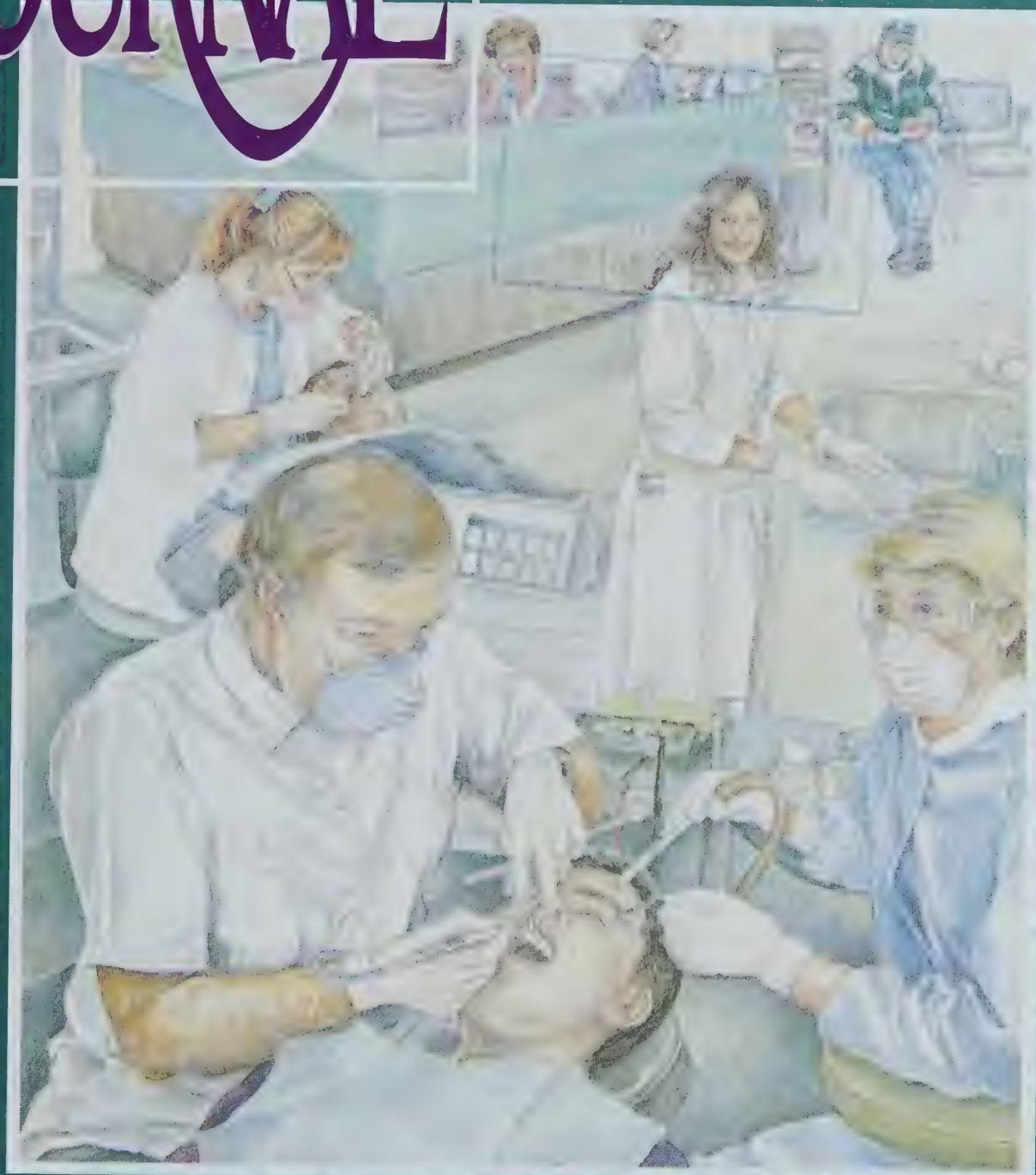
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Notice of change of address should be received before the 10th of the month, to become effective the following month.

Subscriptions: All subscriptions payable in advance in Canadian funds. In Canada - \$48 (+ GST); United States - \$53; all other - \$58.

Subscriptions are for 12 issues, not necessarily conforming with the calendar year. All statements of opinion and supposed fact are published on the authority of the author who submits them and do not necessarily express the views of the Canadian Dental Association, unless such statements or opinions have been adopted by the Association. The editor reserves the right to edit all copy submitted to the Journal. Publication of an advertisement does not necessarily imply that the Canadian Dental Association agrees with or supports the claims therein.

ISSN 0709 8936

PRINTED IN CANADA

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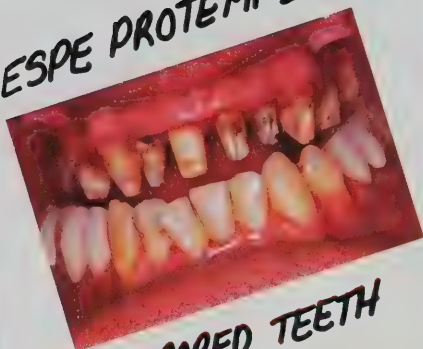
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The Canadian Dental Association is the authoritative national voice, resource, and focus of unity for the profession of dentistry in Canada — dedicated to meeting member needs, and the promotion and provision of optimal oral health for Canadians.

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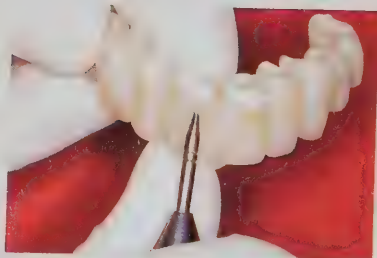
PREPARED TEETH

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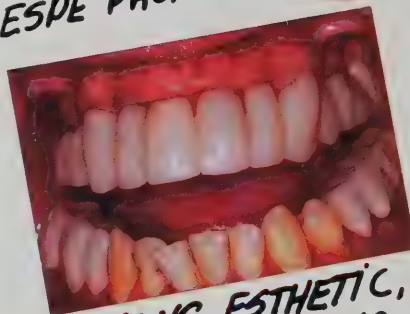
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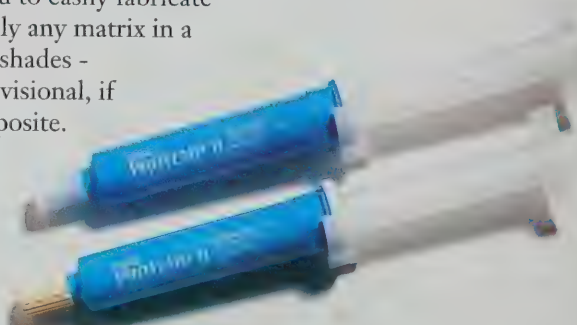


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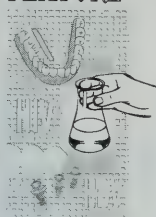
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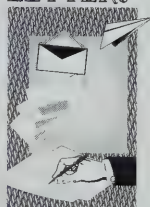
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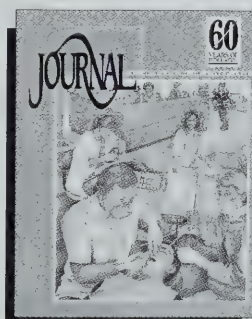
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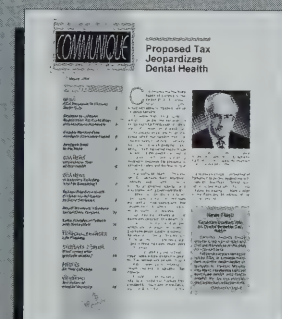
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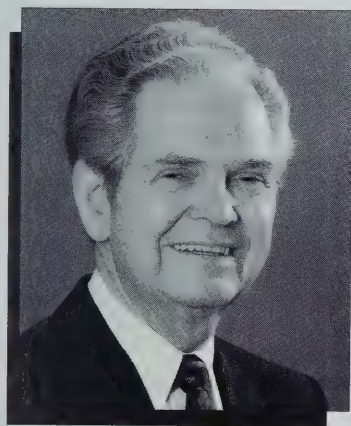
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EDITORIAL

THE TALE OF THE BORROWED TUXEDO



Dr. P. Ralph Crawford,
Editor

As an alert reader, you've probably noticed the bold lettering on the front cover proclaiming practice management as the theme for this month's issue of the *Journal*. And as an intelligent, reasoning individual, you may wonder how an editorial about a borrowed tuxedo could possibly have a connection to dental practice management. Read on.

My tale begins with the invitation my wife and I received to attend a black-tie reception and dinner in Toronto, which was being held in conjunction with a dental meeting that was due to open the next day. We accepted the invitation gladly, and decided to travel to Toronto by car, a five hour drive. It was a relaxing excursion on a pleasant spring day — until we were about an hour outside of Toronto. That's when I suddenly remembered that I'd left my tuxedo at home. It was then about 5 p.m., just two hours before the reception was due to begin, and there was no time to go back for the missing suit.

To make a long story short, we continued on to Toronto regardless and checked into our hotel. Despairingly, I asked the bellman if there

was any place in town where I could rent a tuxedo in a hurry. But when I told him that I needed the suit in 20 minutes or less, his quick response was: "No way!"

Fortunately, as you alert readers will have no doubt perceived, a solution soon presented itself. When Mario — that was the bellman's name — had settled us into our room, he looked me up and down, and said: "You know, you're about standard size. I may be able to help you get a tuxedo after all."

True to his word, within minutes Mario had found a tuxedo and brought it up to our room. The pants may have been a little snug, and the sleeves a little long, but this was no time to get fussy.

When I asked Mario how he'd managed to get his hands on a tuxedo so quickly, he said: "Oh, it belongs to the head waiter, he won't be needing it tonight."

Actually, I didn't really care where he'd dug up the suit. I was very grateful to have it, and showed my appreciation with a generous tip. The rest of the evening was delightful.

When I returned the tuxedo to the concierge's desk the next day, I passed along a note to the hotel manager expressing my appreciation for Mario's resourcefulness. But the story of the borrowed tuxedo didn't end there.

Six months later, I had another occasion to stay overnight in Toronto and chose the same hotel. Once again, I was welcomed by a smiling Mario, only this time I had no urgent haberdashery problem to solve — I'd remembered all my clothes.

On the ride up to my room in the elevator, I learned that a final chapter had been added to the tale of the borrowed tuxedo. My note to the hotel manager had earned Mario the hotel's "employee of the month" award, with a new watch as the prize.

So what, you ask, does the tale of the borrowed tuxedo have to do with dental practice management. Think about it. My simple story really exemplifies all the attributes of successful practice management. I had an

emergency and cried out for help. Mario — busy as he was on the eve of a convention — responded quickly with resourcefulness and understanding. Because I, in turn, took the time to pen a note of appreciation, a shrewd hotel manager recognized Mario's ingenuity and concern for a patron's well-being and rewarded him appropriately. At the same time, and without any hesitation, I returned to the same hotel on my very next visit to Toronto. That was the manager's reward.

This particular issue of the *Journal* addresses a number of practice management concerns. Imtiaz Manji deals with re-engineering, or the recognition that the old ways of doing things may no longer be appropriate for today. Anita Jupp reminds us that a new era of dentistry is dawning, one that will call for constant attention to patient education and case acceptance. Jim Gommerman discusses informed consent and how dentists can avoid litigation. And Marilyn Miller tells us that the architecture of dental offices will never be the same again. In all cases, the intent is to show dentists how to achieve a Win-Win result — just as Mario, his hotel manager, and I did last May.

Without any doubt whatsoever, we all recognize that scientific knowledge and clinical skills are and must be enduring priorities. However, as dentists, we must not overlook the importance of practice management. Dentists, like everyone else in this rapidly changing world, must cope with global economies, shrinking markets, changing priorities and competition. For this reason, I urge you to take advantage of the growing volume of practice management literature, the series of available lectures, and the ongoing opportunities to exchange ideas.

Oftentimes, the business of running a dental practice can be as simple as providing a borrowed tuxedo. All it takes is a little communication, understanding, resourcefulness, ingenuity and gratitude.

P. Ralph Crawford, BA, DMD
Editor of the *Journal of the Canadian Dental Association*

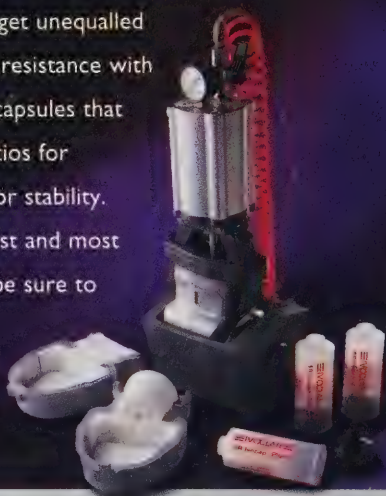
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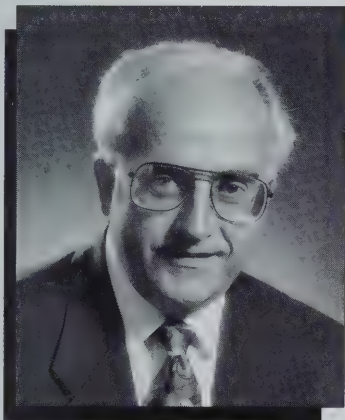
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PRESIDENT'S COLUMN

JUST THE FACTS, PLEASE



Dr. Raymond Wenn,
President of CDA

With the scant attention that the media pays to scientific fact, these days, it is disconcerting to believe that Ontario's minister of health, Ruth Grier, may have formulated her opinions on mercury amalgam based on an article that appeared in *Saturday Night* magazine last November.

This belief is especially worrisome when the article in question, "Dental Flaws," by Morris Wolfe, was, in CDA's view, poorly researched, biased, and misleading. At the very least, Mr. Wolfe's research should have included a simple phone call to CDA for direct comment on the amalgam issue. We would have been pleased to provide him with the scientific facts about amalgam, and to expand on our stated policy on this or any other restorative material.

Unfortunately, the fact that Wolfe never sought CDA's input for his article didn't dissuade him from implying that the dental profession in Canada has been both negligent and protective with respect to the use of amalgam, due to potential "legal" implications. The author also suggested that other countries are considering a ban on mercury amalgam restorations because of possible toxic effects.

Perhaps Mr. Wolfe's failure to approach CDA for comment should come as no surprise. The press routinely uses the amalgam issue to generate "scare stories," in the belief that these types of articles lead to increased readership. I think it is safe to assert that dentists are now accustomed to this particular brand of media hype and hysteria. CDA has developed excellent position papers and policies on amalgam, allowing Canadian dentists to provide calm, reasoned responses to the concerns expressed by their patients.

Unfortunately, I also think that it is safe to assert that Canadian politicians tend to give much more weight to these scare stories than they actually deserve. As a case in point, Mr. Wolfe's article appears to be the stimulus that encouraged Minister Grier to correspond with the Honourable Diane Marleau, the federal health minister, on the amalgam issue.

In her correspondence, Minister Grier expressed concern that the health of many Canadians could be at risk due to mercury amalgam, and stated that Germany and Sweden appear to have already acted on the issue.

A simple request to CDA for information on this subject would have provided the following information:

- In Germany, the Public Health Department has banned the use of γ -2 (gamma-2)-containing amalgam, based on 15 years of clinical and laboratory research demonstrating the superior clinical performance of high-copper γ -2-free amalgams. The department did not ban the use of high-copper (γ -2-free) amalgams, stating that there is no conclusive evidence to suggest that the mercury in amalgam causes headaches, rheumatism, cancer or multiple sclerosis. Furthermore, the department is advising practitioners not to remove existing γ -2-containing amalgams unless there is strong evidence of an allergic reaction.
- In Sweden, the Swedish Medical Research Council held a state of the art conference on dental restorations in April of 1992. Their

conclusions contained the following points, among others:

1. Mercury released from dental amalgam does not contribute to systemic disease nor systemic toxicological effects;
2. Allergic reactions to the mercury in amalgam fillings are extremely rare.
3. Potential environmental consequences resulting from the use of mercury amalgam can be controlled by proper waste management;
4. Available data do not justify discontinuing the use of mercury-containing dental amalgam fillings or recommending their replacement.

While it is true that Sweden is examining a possible ban on the use of dental amalgam, its motives are based entirely on environmental — not health — concerns. Other countries are also looking into the environmental impact of mercury.

Obviously, the dental profession has a responsibility to protect both the health of our patients and the environment they live in. We must continue to follow and support proper waste management procedures to ensure that the use of mercury amalgam does not harm our patients — or the environment — in any way.

It should be clear to all of us that we cannot rest on our laurels when it comes to the issues that affect our profession. The fact that we have taken a highly ethical, non self-serving stance on the question of amalgam toxicity seems to draw little credit on its own. All of us, as concerned health care providers, should do everything we can to ensure that both our patients and our politicians are fully aware of the facts about mercury amalgam.

It's up to us to ensure that Canada's policy and law makers are not so easily swayed by what they read in the media, and that they readily turn to the profession to obtain the truth. To say the least, the fact that a minister of the Ontario government could be moved to action on the basis of Mr. Wolfe's article came as quite a shock.

Raymond Wenn, DDS
President of the Canadian Dental Association

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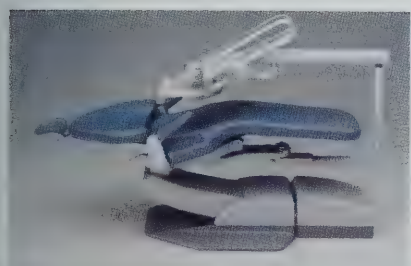
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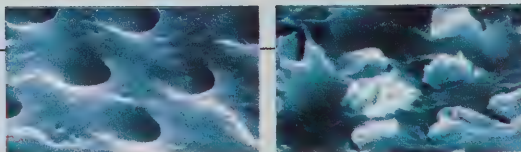
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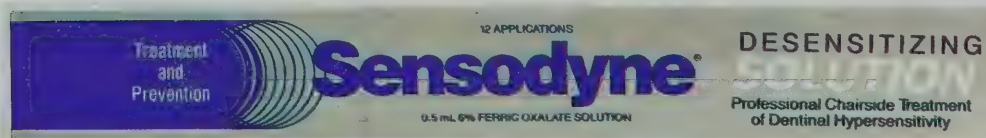
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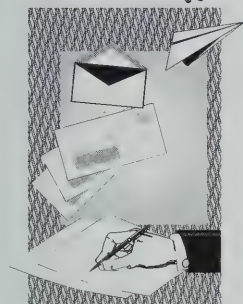
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LETTERS

LETTERS



AIDS and Dentistry

I am writing about the conclusions reached by Dr. John Hardie in his article, "Aids and Dentists: A Retrospective Analysis of the Florida Case," in the December 1993 *Journal* (59:987-991, 1000, 1993). Dr. Hardie comments that Dr. Acer could not have infected his patients deliberately as: "A deliberate exposure would have involved the infusion of large amounts of blood at once, or small amounts of blood on a number of occasions, to many patients. It is inconceivable, under such circumstances that Dr. Acer's activities would not have been discovered..."

Yet we are supposed to believe that exactly such a transfer of blood occurred unintentionally, without Dr. Acer, his staff or his patients being aware. I think not.

When we hear of seemingly increasing numbers of depressed or deranged members of society venting their frustrations by violent acts on innocent, unknowing victims, why is it so hard to accept that one such dentist could have inoculated patients with HIV in a misguided attempt at vengeance?

Melanie R. Wood, DMD
Winnipeg, Manitoba

AIDS and Dentistry

I must congratulate Dr. John Hardie on his article, "Aids and Dentistry: A Retrospective Analysis of the Florida Case." It is the first article in the dental literature that I have come across that acknow-

ledges the unorthodox viewpoint presented by Drs. Duesberg and Root-Bernstein. Current, politically correct thinking of all the vested interests who are busily collecting grant money to investigate HIV does not allow for the possibility that they may all be wandering up a blind alley.

The energy and passion that has been expended in denying the possibility that HIV is only an incidental finding in the development of AIDS is an indication of the threat that this poses. Dr. Hardie should be recognized for acknowledging the possibility that there are other explanations. This whole HIV and AIDS issue in dentistry has been characterized by hysteria rather than scientific thinking, and I once again congratulate him on his well thought out and most reasonable review of the Acer case and accompanying investigations.

S.J. Fisher, DDS, FRCD(C)
Victoria, B.C.

Editor's Note

Dr. Fisher's comments have been communicated to Dr. John Hardie, who recently stepped down from his role as the *Journal's* consulting editor in the area of infection control. Dr. Hardie has taken on new challenges and responsibilities in Saudi Arabia. His numerous articles challenged the thinking reader and stimulated frequent letters to the editor. The *Journal* sincerely thanks Dr. Hardie for his tireless efforts and wishes him well.

Dental Fraud

I was in wholehearted agreement with Dr. Wenn's column regarding fraud in the December 1993 issue (Dental Fraud A Betrayal Of Trust, 59:961, 1993), until I came to his contention that it is fraud to redo a ditched amalgam that "may have lasted for another year."

Our mandate is to serve the best interests of our patients, not to minimize the short-term financial liability of their insurance companies. Delay in performing restorative treatment can result in the need for

more complex or compromised procedures later. Deciding when a restoration should ideally be replaced is a judgment call, involving many factors, and different practitioners will sometimes judge it differently. To say that someone whose opinion differs from your own is committing fraud seems to me to be self-righteous and presumptuous.

Brian D. Read, B.Sc., PhD, DDS
Calgary, Alberta

Latex Allergy and Spina Bifida

Latex allergies have reached near epidemic proportions among people affected by spina bifida. Frequent surgeries and other procedures, and the recent trend of self-catheterization for bladder management, have meant high levels of latex exposure for many people with spina bifida. Allergic reactions can range from mild to deadly. What may present itself as a slight rash or wheezing on one occasion may, at the next exposure, manifest itself as life-threatening anaphylactic shock.

Because most latex-sensitive individuals will not be aware that a visit to the dentist puts them at risk for a reaction, the Spina Bifida Association of Canada urges dentists to ask their patients about latex allergies prior to beginning any examination or treatment.

An allergic reaction to latex can be deadly. Please ask, listen, and when indicated, choose latex-free alternatives, such as vinyl or hydrocarbon polymer gloves, when treating patients who have spina bifida and/or who tell you that they are latex sensitive.

Please call 800-565-9488 for further information.

Helene C. Peters, CAE
Executive Director
The Spina Bifida Association
of Canada

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NEWS UPDATE

Maggots in the News

Recent reports indicate that the lowly (and oft despised) maggot may work better than the most expensive antibiotics and medicines in some cases.

According to the authors of "Maggot Medicine," published in *Discover* (14[8]:17, 1993), maggot therapy may be about to enter its heyday. In fact, they believe that modern medicine is already well on the way to rediscovering the healing power of maggots.

Actually, maggots have been used by healers around the world for centuries. The ancient Mayans knew about them 1,000 years ago; European doctors, as early as the 1500s, noticed that the maggot-infested wounds of soldiers healed well; and William Baer, an American doctor during the First World War, discovered that soldiers left on the battlefield for a week suffering from maggot-infested abdominal wounds generally recovered better than men with similar wounds treated in the military hospital.

As late as the 1930s, hundreds of hospitals still used maggot therapy routinely. But as antibiotics were discovered and came into vogue, maggots became a little remembered part of medical history. Today, however, maggots seem to be making a comeback.

Maggot therapy is a relatively simple technique that involves using blowfly maggots (including common bluebottles and greenbottles, but not screw worms) to devour dead tissue. The blowfly eggs are first placed in the patient's wound. When the eggs hatch, the maggots crawl into the wound, eat the dead flesh, and excrete compounds that kill harmful bacteria. Finally the larvae metamorphose and fly away.

Dr. Jan Petro, a surgeon at New York Medical College, uses maggot therapy to remove the tissue killed by tumors or burns in patients who would be endangered by surgery. "Maggots are more effective and cheaper than a lot of incredibly expensive commercial compounds," he says.

In another article, released by Canadian Press, a reporter describes how Chinese scientists have developed nutrition-rich extracts from common fly maggots, which they hope to mass produce.

According to the article, amino acids from the fly larvae are being "touted" as a children's food supplement. In addition, their low-fat oil is supposed to help prevent heart disease. The flies, which produce billions of maggots every week, are kept in large bottle and fed distillers' grain, wheat bran and farm waste.

Dr. Clayton Pugh Dead At Age 72

Dr. Clayton Pugh, the dentist who pioneered the Yukon's first school dental program, died in Whitehorse January 9. He was 72.

Born in Westport, Nova Scotia, Dr. Pugh served as a bomber pilot during the Second World War. On his return to Canada, he obtained his degree in dentistry at Dalhousie University. He then completed two years of service in the Naval Reserve before joining the Canadian Army Dental Corps.

Dr. Pugh first fell in love with the Yukon when he was posted to Whitehorse in 1954. In 1958, after serving with the Dental Corps in Germany, he retired from the Forces and established a private practice in Shelbourne, Nova Scotia. But three years later he went back to Whitehorse and opened a dental clinic with the late Dr. Ned Banks.

On his return to the Yukon, Dr. Pugh became very concerned about the poor dental health of the local children. Working with the territory's commissioner and Health Canada's chief medical officer, he established a unique dental therapy program. It was the first program in Canada where children were first examined by a dentist, but the actual treatment plan was carried out by a dental nurse.

Initially, the nurses involved in the program came to the Yukon from New Zealand and the United Kingdom, where the use of dental nurses was already widely accepted. The success of Dr. Pugh's

program, which was taken over by the federal government in 1972 and placed under the jurisdiction of Health Canada's regional dental officer, eventually led to the development of a dental therapist training program in Fort Smith, N.W.T.

Informed Consent

Dentists should always obtain informed consent from patients prior to initiating any treatment procedures, says the Royal College of Dental Surgeons of Ontario.

In a recent Bulletin to the profession (No. 15, November 1993), the college warned dentists that Ontario's courts have repeatedly held that a patient: "has a right to refuse treatment even when the treatment proposed is reasonable and necessary for the patient's health."

Therefore, the college believes that dentists must obtain informed consent prior to initiating any treatment, unless: "the treatment is necessary to save the patient's life and there is no reasonable opportunity to obtain the patient's consent."

To make this point abundantly clear, the Bulletin describes the case of a dentist who was fined \$8,500 for failing to obtain informed consent prior to extracting eight maxillary teeth. The patient had come to the dentist's office, in considerable pain, asking to have five maxillary teeth extracted. On examination, the dentist found that the patient's teeth were all periodontally compromised. It was impossible to perform a full periodontal examination because the patient suffered severe pain on probing due to soft tissue inflammation. The dentist then offered to complete the examination under local anesthetic, and to perform periodontal cleaning in an attempt to save some of the patient's teeth. However, the patient continued to insist that he wanted five teeth extracted.

At a subsequent appointment, the dentist anesthetized the patient and began the extractions. When it became obvious that none of the patient's maxillary teeth would make a suitable abutment for a par-

tial denture, the dentist extracted all eight teeth.

Because the dentist had not obtained the patient's informed consent to extract all eight teeth, and because "the retention of the three teeth was not life threatening and, in any event, the member had an opportunity to obtain the consent of the patient prior to preforming the extractions," the court upheld the patient's suit and awarded him \$8,500.

In another case, the court awarded a dental patient \$31,000 for general damages, remedial treatment and loss of wages. This patient had been referred to an oral and maxillofacial surgeon for the extraction of impacted third molars. Following her surgery, the patient developed a lingual paraesthesia. She sued the surgeon, claiming that she had not been advised of the risk of paraesthesia.

It was later determined that the referring dentist had not made the patient aware of the risks inherent in the proposed treatment, believing that it was the responsibility of the oral surgeon to obtain consent. He, in turn, assumed that the referring dentist had obtained informed consent prior to making the referral.

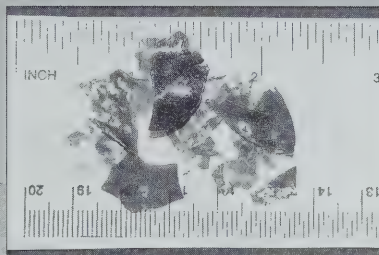
In this situation, the college believes that: "It is always the responsibility of the treating dentist (in this case the oral and maxillofacial surgeon) to obtain a valid informed consent. The treating dentist should have explained the alternatives open to the patient and the material risks and benefits of each course of action."

The college also recommends that referring and treating dentists establish good communication links to ensure that they are both clear on who is responsible for the various phases of a patient's treatment. ■

"WHAT'S IT?"

This month's mystery item arrived at the CDA Museum in a box labelled red rubber. However, the word rubber had been crossed out and replaced with the word "shellac," which was written on the box in pencil. The box contained thin, flat, red flakes of varying sizes. What are they? And if they are actually flakes of shellac, what were they used for?

If you know the answer, please contact: Dr. Ralph Crawford, Editor of the Journal of the CDA, 1815 Alta Vista Drive, Ottawa, ON K1G 3Y6. ■



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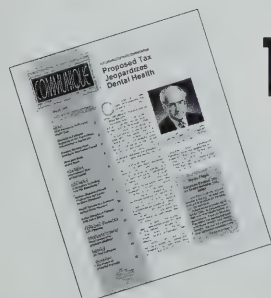
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CDA LIBRARY

What's New In the Library This Month?

This month's library package features 25 articles on quality assurance in dentistry. The package is available to all CDA members at the cost of \$5 per package (plus applicable taxes). To obtain your copy, call the library at 1-800-267-6354 or 613-523-1770; extensions 223, 226, 270, 271, 234; or fax us at: 613-523-6574.

The articles included in this month's package were located through a MEDLINE search. Members who are interested in obtaining articles on specific topics may contact the library to order a personalized MEDLINE search.



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Videos

Thanks to Dr. Ron Jordan for his generous donation of the following videos to our library collection, which are available for loan to CDA members at a cost of \$5, shipping and handling included:

1. A complete and clinical demonstration of the placement of labial veneers plus two-year recall. Drs. R.E. Jordan and M. Suzuki. 55 min.
2. Concept (North American). (Inlay, onlay techniques, posterior composite techniques). Dr. R.E. Jordan. 20:40 min.
3. Conservative crown build up with an ideal composite system "Ultra-bond and Perfection." Dr. R.E. Jordan. 14:20 min.
4. The ideal bonding system. Dr. R.E. Jordan. 50 min.
5. Patient education: At home vital bleaching; Rembrandt Bleaching Gel, a clinical report. Dr. R.E. Jordan. 16 min.
6. Porcelain labial veneers-cerinate system. Drs. R.E. Jordan and M. Suzuki. 48:50 min.
7. Postgraduate course for placement of modern posterior composite materials. Drs. R.E. Jordan and M. Suzuki. 56 min.

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MARCH, 1935

THE PRACTICE OF DENTISTRY IN THE DROUGHT AREAS OF THE WEST

by *Sylvister Moyer, DDS, Rockglen, Sask.*

The Depression, the drought, and the hoppers have brought both tragedy and comedy to the dried-out area which spreads over the southern section of the Prairie provinces.

As a result of the crop failure for six successive years, a peculiar condition has arisen, causing the absolute lack of money even for the bare necessities of life. Every farmer is on relief. Automobiles have been converted into "Bennett-Buggies," and former well-to-do farmers, living in grand houses, are bemoaning their painful poverty. As a consequence, dental needs were totally neglected until pain conquered pride, and proud mothers were compelled to bring their crying children to me for help, since I am the only dentist within a radius of 40 miles. These mothers, with tears in their eyes, would say: "We have no money. Can't you help us."

What did I do? I did just what you would have done, dear reader. I dried more tears and sent more swollen faces home, wrinkled with smiles, during the past three years than I have done during the 40 preceding years of my dental practice, 15 years of which were spent in Galt, Ontario.

One hundred and thirty-four indigent patients called at my office last year. When it became known that they could get an aching tooth removed even without money, whole families came. Some came in wagons, others in Bennett Buggies, some on horseback, and others on foot, even in the dead of winter.

Abscessed teeth, swollen faces, pyorrhea, edentulous mouths, and unbearable pain, were all among the problems that had to be dealt with.

In this service, however, I was not dispensing charity, for these patients did not wish to be pauperized. They were proud and honest and are still bravely looking for the "rift in the clouds."

They ask for my "bill," which is never questioned and is always strictly ethical. They say, "What can we bring you?" and it is here that I profit from the conditions of adversity. For ex-

tractions they usually bring vegetables or poultry. For more extensive service, as fillings, dentures, etc., I require about 25-per-cent cash and the balance in "What have you?" Barter still continues, as my records show: a scoop-shovel for extracting a tooth; a thoroughbred Angus bull for a full upper and lower denture for a lady in a big house; 200 live hens and many dead ones; 50 turkeys, 20 ducks and geese, 100 pounds of butter, eggs, fresh pork and sausage, sauerkraut, a cellar full of vegetables, cook-stove, heater-stove, 15 bags of potatoes, 12 tons of lignite coal, 500 fence posts, \$35 worth of blacksmithing, \$40 worth of groceries, mower, wagon, Essex coupé with rumble seat, a garage, five sets of team harness, three horse-collars, four bridles, saddle, 30 head of cattle, 13 horses, six live pigs and one dead one, blacksmithing outfit, eight tons of hay — but let this suffice.

In all this co-operative bartering business, I have felt the thrill that one experiences from serving and pleasing — more comedy than tragedy.

Quite recently, a rather reticent young man presented himself and said, "Toothache." I extracted. He put on his hat and said, "Hen or Gobbler?" I said, "Gobbler."

For a country blacksmith's widow, I extracted her teeth and inserted a full upper and lower denture, and in payment received a cow, a calf, and part of a blacksmith's outfit. She was made so attractive that she was able to marry again within a year and a day of the passing of her first husband — bride, groom, and dentist all happy, and no money exchanged hands.

Our milkman and his wife had both been toothless. I provided them with teeth for which they gave me two cows and calves. These, in turn, I gave to my hired man to square with him. The same day he traded them to Bud Chelson for a seed-drill and a two-furrow plow. In this way, five persons got rid of what they did not need and in exchange got what they wanted. Not a dollar was required and all were happy.

60

But while I have found these new paths of business thoroughly interesting, I am conscious of the fact that I have, to a certain extent, lost touch with my dental friends and dental associa-

tions, which I trust may be renewed when once we reach "Prosperity Corner." In the meantime, we will keep our chins up, even though there be Russian thistle in the stubble.

Editorial

THE SPIRIT OF THE PRAIRIES

M.H. Garvin, DDS, Winnipeg, Manitoba

To our readers, who feel that they are facing many hardships in these strenuous days, we advise you to read the article in this issue entitled "The Practice of Dentistry in the Drought Area of the West," by the late Dr. Sylvester Moyer of Rockglen, Saskatchewan. It will make you tighten your belt and go to work.

Whether this editorial might not better be written on the subject "The Uncertainty of Life" is problematic, since Dr. Moyer died suddenly just three days following the writing of this paper for the Journal, a great shock to his many friends.

Dr. Moyer had been in practice 40 years, but had recently found himself in the centre of a famine area where people had no money to pay for dental service, even though they wished to do so. Adversity has the effect sometimes of bringing to the fore talents which otherwise would have remained dormant, and so it was with Dr. Moyer. He was not daunted by such problems, but went to work with an optimism that puts the average younger man to shame, looking forward to the time, when once again he might be able to attend dental conventions, and fraternize with his brethren in the profession. In imagination I can hear him quote the words of Horatius Bonar:

"What though ten thousand faint
Desert, or yield, or in weak terror flee!
Heed not the panic of the multitude;
Thine be the captain's watchword,
— Victory!"

Dr. Moyer might have moved to more promising harvest fields. He might have refused to give service because of the inability of his patients to pay, and lived on his savings. He might have spent his time hammering at the government to provide adequately for these unfortunates. In any case, one might have expected him at least to complain of the gathering clouds. But no, he had the spirit of the great Northwest, which does not know defeat. He had the spirit that William Prescott had in mind when he penned these splendid lines:

"How can you keep a determined man from success? Place stumbling-blocks in his way, and he uses them for stepping-stones. Imprison him, and he produces the 'Pilgrim's Progress.' Deprive him of eyesight, and he writes the 'Conquest of Mexico.'"

It is to these men in the lonely spots of our great Canadian nation, as well as to the leaders in our metropolitan centres, that the Journal of the Canadian Dental Association wishes to bring a message of hope and inspiration. We can do so in very many ways if every dentist in Canada will loyally support our Canadian Dental Association. We urge all to place our national organization first in our thought and in our effort. Let us choose our leaders from among those who think nationally and who will carry out our wishes in this regard. The voice of the Canadian Dental Association will then be heard from coast to coast throughout Canada, and every dental practitioner will benefit there from.

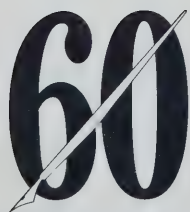
Diamond Jubilee of Publication

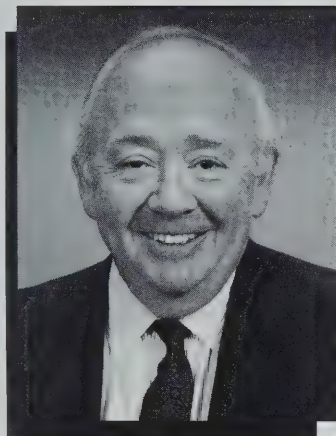
Throughout 1994, the Journal of the Canadian Dental Association celebrates 60 years of publication as the authoritative "voice" of dentistry in Canada. Each month, in commemoration of its Diamond Jubilee, the Journal will reprint an article from Vol. 1, 1935.

This month's feature, The Practice of Dentistry In the Drought Area of the West, was writ-

ten by Dr. Sylvester Moyer (1859-1934) of Rockglen, Sask. A graduate of the Royal College of Dental Surgeons of Ontario class of 1892, Dr. Moyer was a past president of the Ontario Dental Association. He moved to Saskatchewan in 1917.

We have also included Dr. M.H. Garvin's editorial, for obvious reasons.





Success in the Service Era: How CDSPI Is Responding

Dr. Rod Moran

President of CDSPI

At the risk of showing my age, I'm going to tell you that I remember the days when it seemed as if every company boasted about their product's uniqueness. And often it was a product's "unique selling point" — as the marketers call it — that made the customer buy.

That's not really the case anymore. True, some companies still offer some products with unique qualities — Canadian Dental Service Plans Inc. (CDSPI) among them — but, by and large, the days when the majority of companies could make that claim are long gone. Today, for the most part, any unique product that sells is quickly copied by the competition, resulting in a marketplace filled with me-too products.

So how do customers decide which products to buy and which company to buy them from? Service. That's the most significant differentiating factor for today's consumer. A company must determine what type of service the customer wants, deliver that service consistently, and respond to the customers' evolving needs with quality service improvements. The best service wins.

Determining the Service Dentists Want

At CDSPI, we offer financial programs — more specifically insurance and retirement investment plans — for dentists. Serving den-

tists (with the support of organized dentistry) is our only mandate, so we go out of our way to understand the dental community.

We know, for example, that the majority of dentists would rather focus on their practice than spend a lot of time shopping around for insurance and comparing investment products. And once these financial programs are purchased, most dentists don't want to spend any more time than is absolutely necessary to manage them.

So CDSPI's service approach is based on offering dentists time-saving measures and conveniences.

CDSPI's Services

Before I outline some of CDSPI's individual services, I must mention the biggest time saver of all: one-stop shopping. What can possibly save you more time than going to one place (that you trust) for virtually all your personal and practice insurance needs, as well as your retirement investment products.

Once you've selected the programs CDSPI offers, convenience starts — appropriately enough — from the beginning, when you fill out an application form. InstApply™ service is designed to make filling out insurance plan applications easy, instead of a chore. You simply make a toll-free call to a CDSPI personal service representative, who will fill out an application on your behalf (based on information you provide) and then

mail it out to you to review, make any necessary changes or additions, and sign.

In fact, any time you have a question or want more information regarding one of our financial programs, all you have to do is call our toll-free line and we'll help you out. (We keep extended hours to better serve customers in Western Canada.) If we have to get back to you with more information, we'll call you at the time you tell us is best — at your convenience, not ours. We'll also send out any detailed information you may require.

What if an insurance agent approaches you with a policy for you to consider? You can use CDSPI's Insurance Review Service to help you understand what the policy offers, free of charge. Simply send in a copy of the policy, and we'll have an independent reviewer evaluate it, weigh it against the comparable CDIP policy we offer, and send you the written result.

We also make it easy if you ever need to make a claim. If an incident you're covered for happens on a weekend or holiday, you can call our regularly monitored Emergency Claim Response line. And any time you're making a claim, a representative at CDSPI acts, if necessary, as a liaison between you and the insurer to make the process as smooth as possible.

Another service, popular with dentists participating in the CDA



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For Dentists (Caulk) Dentist Division.

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For Hygienists (Ash) Hygiene Division.

This new innovative division has been formed to fill your preventive and asepsis needs. You'll recognize such outstanding examples as Delton, Nupro, Rite-Angle, and the entire family of Cavitron products, featuring the new Steri-Mate sterilizable handpiece — all products you can count on.

For Prosthetics Laboratory Division.

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products, SLM and IPN, offer the most complete line of shades and moulds available in Canada. And in The Lab merchandise area, such tried and trustworthy products as Triad, Jeltrate and Lucitone, have raised standards of excellence in the industry.

Across all our Dentsply Canada divisions, we're committed not only to making the highest quality and broadest range of dental products but also to making those products conveniently available to you. That's why we work with only the leading dealers across the country, offering you the best service and the fastest delivery.

We'd like to tell you more about everything we can do for you, and, about our new Implant Division. Admittedly, it's a mouthful. But you'll be hearing from one of our representatives very soon, and it's well worth a listen.

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RSP plan, is the CDA RSP Quote Line, which provides updated CDA RSP GIC rates, as well as the unit values of the investment funds.

There are many more services that CDSPI offers, but I think you get the picture — we back up our products with convenient services designed to make your life a little easier.

Our Objective: To Serve You Even Better

Today, service is what it is really all about. At CDSPI, service starts by providing dentists with the type of assistance they want to a very high standard. But it continues by constantly improving services to meet dentists' evolving needs. We're committed to improving the services we currently provide, and introducing new ones as your needs demand.

So it's no wonder so many dentists are already taking advantage of CDSPI's many services. I encourage you to do the same. ■

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BOARD OF GOVERNORS

NOTICE OF MEETING The Interim Meeting

The Interim Meeting of the Board of Governors of the Canadian Dental Association will be held April 9, 1994 (Saturday), at the Westin Hotel, Ottawa, commencing at 9:00 a.m.

It is brought to your attention that meetings of the Board of Governors are open to all members of the Association.

The Board is composed of twenty-five governors with voting privileges and a Chairman. Governors represent members across Canada on a 1 to 500 ratio. The Canadian Forces Dental Services, Student members and Affiliate members from Québec are represented by one member each.

In addition, there are two non-voting members, namely, the senior dental representatives of Health Canada and the Department of Veterans Affairs.

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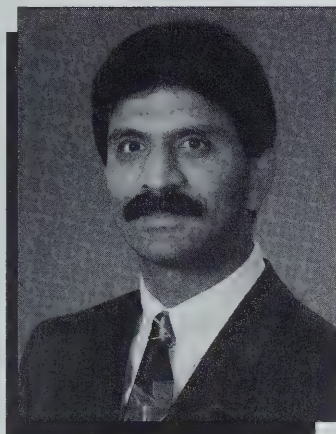
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Re-engineering the Dental Practice

Imtiaz Manji, B.Sc.

President of ExperDent

In January, we discussed the phenomenon of re-engineering and how it is shaking up corporate North America. In February, we described why dentists should re-engineer their practices and how they could convince their team of re-engineering's value. Now, in this final instalment of our three-part series on re-engineering, we'll talk about how to go about re-engineering in the dental environment — and what you can expect your re-invented practice to look like.

Leading the Way Through Discontinuous Thinking

Re-engineering requires the participation of the entire dental team, but the dentist needs to assume the role of leader throughout the process of change. This doesn't mean that you should dictate change, but only that you should rally your troops to the re-engineering cause. For inspiration, consider the sweeping changes taking place in the corporate arena. In a recent issue of the *Globe and Mail's* "Report on Business Magazine," management guru Tom Peters claimed that timid leaders are bound for oblivion this year, and that "'transformational leadership' will be one of 1994's popular buzz phrases."

Start by scheduling regular meetings with your staff to deal exclusively with the re-engineering project. Make it a special project,

and don't put re-engineering on the agenda for your day to day staff meetings. It is too important and broad to be sandwiched between a discussion of, for example, new office hours and practice renovations.

Early on in the process, the team must embrace what Michael Hammer and James Champy, the authors of *Reengineering the Corporation: A Manifesto for Business Revolution*, call discontinuous thinking. It entails "identifying and abandoning the outdated rules and fundamental assumptions that underlie current business operations." And, quite frankly, it is the key to successful business redesign.

A dental practice that simply assumes that the office hours it's maintained for a decade are still meeting patient needs is no better than the corporation that never questions its belief that "local warehouses are necessary for good service." Although the practice's office hours and the corporation's local warehouse structure may have made good business sense at one time — and perhaps for a long time — it doesn't necessarily hold true that they still make sense today. Discontinuous thinking allows you the freedom to question these "givens" and to make the mental leap from cosmetic to core changes.

Basic philosophical questions

must be answered before re-engineering can take flight, however. The dental team must ask why their practice exists, why it does the things it does, and why it does them in certain ways. The answers to these questions often reveal that the practice's purposes — to provide quality dental services and deliver value to patients — are not always achieved in the most logical or productive way.

Shifting from Tasks to Processes

Re-engineering requires team members to replace their task-oriented approach to work with a process-driven one. Unfortunately, many dental practices are plagued by the fragmentation of their work processes. Although everyone is doing their part (input), they are too focused on their own tasks to think about the processes they're involved in, let alone the overall results (output). Because of this fragmentation, tasks may be duplicated, not done where and when they should be, or neglected all together.

The dental team first needs to identify the various processes within the practice. This will make it possible to isolate those warranting the most attention, and to plan appropriate action. You won't be able to tackle everything at once, so you want to choose these processes carefully. For example, are

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March/
Mars
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Vol. 60
No. 3



you having trouble collecting, getting patients to accept treatment, or seeing patients on time? Which process is suffering the most? The answer to these questions will help you to establish a priority list for process redesign.

Let's take the example of a patient coming in for a hygiene appointment to illustrate what happens when the dental team shifts its orientation from a task to a process approach.

Before Re-engineering

The patient reports to the front-desk receptionist (who is often barely audible behind her sliding window). The patient isn't told if the hygienist is running on schedule, and takes a seat without knowing whether to expect a five- or a 30-minute wait. Later, in the clinical area, the hygienist seats, treats, and dismisses the patient. She then directs the patient back to the administrative area, where financial/insurance matters are handled. One of two things then occurs. Either the receptionist automatically schedules the patient's next hygiene appointment (without any communication with the hygienist as to whether the patient's hygiene status warrants him coming in at a different frequency). Or, even worse, the receptionist simply collects the appropriate fee and dismisses the patient, who then leaves the office without knowing the appropriate date for a return visit.

After Re-engineering

The patient arrives to find a receptionist with whom he can communicate, one who makes it clear (without waiting to be asked) whether the hygienist is running on time and how long a wait the patient should expect. Since the receptionist has reviewed the patient's chart at the morning staff meeting, she may offer the patient reading material of interest, be it on cosmetic dentistry or preventing gum disease. The patient then takes a seat.

During the continuing care appointment, the hygienist not only does what's required clinically, but also discusses general oral health and dentistry with the patient —

everything from outstanding treatment plans to the imaging system recently purchased by the practice. (Since she spends more time than any other team member educating patients, the hygienist recognizes that she is a key player in patient retention). And because she has the advantage of a chairside terminal (or an organized manual appointment book), she books the patient's next hygiene appointment herself, based on the particular needs of the individual. Back at the front desk, the receptionist still handles the financial/insurance matters, but also confirms that the patient's next hygiene appointment is booked.

Compare and Contrast

The differences in the above "before" and "after" scenario are quite profound, namely because the focus is no longer on the individual tasks performed by team members, but on the process as a whole. For example, the natural place for the patient's next hygiene appointment to be booked is at chairside. But that doesn't mean the administrator reneges all responsibility in this area. By taking an interest in managing the process rather than their individual tasks, the team reduces not only the potential slippage in the practice, but also the need for superfluous checks and controls. Because everyone is clear on their particular roles, the processes become self-managing.

Whether you implement the lessons learned through this example or you implement other forms of process redesign, you'll reap similar results. By re-engineering your dental practice, you release the controls on employees, giving them the power and the responsibility for decision-making. The stranglehold on staff creativity is loosened and innovation flourishes. In a re-engineered practice, new ideas (even radical ones) on how to better serve patients are not only encouraged, they're solicited. (In the practice's former incarnation, these ideas were often quickly dismissed without proper consideration of their merit. Staff became fatigued and stifled, and soon stopped making suggestions.)

Innovation is related to the concept of continuing education. Although many dental practices are avid continuous education attendees (be it because CE is required for them to remain certified, because they're keen, or both), the value of this knowledge cannot be underestimated. In every profession, including dentistry, re-engineering demands that workers are not only trained in every aspect of *how* to do their jobs, but also, and more importantly, that they're also educated on *why*. When they have insight into why they're doing what they're doing, they can adapt to change.

"In an environment of flexibility and change, it is clearly impossible to hire people who already know everything they're going to need to know, so continuing education over the lifetime of a job becomes the norm in a re-engineered company," say Hammer and Champy. And if you look to organizations where employees are thinking creatively and innovating, rather than focusing solely on their input, chances are that an emphasis on continuing education is paramount.

Because the organizational structure is flattened through re-engineering, the team work concept infuses the practice. Jobs are inter-related, interdependent and multi-dimensional. There is a shift in the value system of the practice. Each team member realizes that his or her job is important; that it's beneficial to tackle problems creatively; that patients are the reason the practice exists (not to mention the salary providers for the team, including the dentist) and that the practice's ultimate success or failure is a collective responsibility.

Shifting from Activity to Results

I've yet to see a dental practice where there are staff sitting idle, wondering what they could possibly do to keep themselves busy. In most dental practices, frenetic activity seems to be the status quo. But busyness should not be equated with results. There can be a lot of activity going on, but if it's



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not creating the desired output, keeping busy is all it is.

You and your team need to analyze your work processes (new patient experience, case management, accounts receivable, continuing care, marketing, etc.) to determine what each staff member typically does in a given work day. Ask yourself whether all of these activities really contribute toward achieving the desired results. Could some of this work be done differently or eliminated altogether? It's amazing how many things are done out of habit rather than because they have enduring validity in the present.

When results take precedence over activity, you know the practice isn't just paying lip service to re-engineering but it is actually accomplishing it.

Summary

Although this is the last in our three-part series on re-engineering, it's unlikely to be the last word you'll hear on the subject. The organizations that experience continued success as we approach the next millennium will be those that can adapt to the ever fluid economy by making core — not cosmetic — changes. And it is the concept and implementation of re-engineering that will provide the model for doing just that. ■

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CDA 1994 Awards Nominations Sought

CDA is seeking nominations for its 1994 awards, including CDA Honorary Membership, Distinguished Service, and the Award of Merit. Nominations received by April 8 will be reviewed by the CDA nominations and awards committee, which will then make recommendations on suitable award winners to the association's Executive Council. The 1994 award recipients will be named during the annual meeting of the CDA board of governors October 2 in Vancouver.

No more than one individual should be proposed for Honorary Membership or the Distinguished Service Award, and submissions must include detailed curriculum vitae for each nominee. Although submissions should indicate the award an individual is being nominated for, the nominations committee reserves the right to recommend which award, if any, will be granted to that person.

Honorary Membership

The association's highest honor is honorary membership, which recognizes individuals deemed to have made outstanding contributions to the art and science of dentistry, or to the dental profession, over a sustained period of time. Although this award may be for service that is provincial, national or international in nature, an outstanding contribution at the national level shall be a principal consideration.

In general, only one or two honorary memberships are awarded annually, and CDA may elect not to present this award in any given year. Winners receive a personalized parchment scroll and a lapel pin. Honorary members who are licensed dentists are exempt from CDA membership dues, and all winners may attend association-sponsored scientific and social functions, as well as annual meetings and conventions, at no cost.

Distinguished Service Award

CDA's Distinguished Service Award is presented to dentists or laymen to recognize either an outstanding contribution in a given year, or outstanding service over a number of years. It may also recognize outstanding contributions to the dental profession at the academic, corporate, specialty society, council or committee level.

Recipients receive an engraved plaque.

Award of Merit

The Award of Merit is presented annually to an individual who has served in an outstanding capacity in the governing of CDA or who has made similar contributions to Canadian dentistry. Candidates should have served at least two full terms as a governor of the association and two full terms on the Executive Council, or four years as a council, commission or committee chairman, or a number of years with a dental organization, institution or specialty section.

The recipient receives an engraved plaque.

Certificate of Merit

The Certificate of Merit recognizes special service at any level of dentistry. In general, it is reserved for Canadian dentists and other individuals who have given at least one full term of service on a council, commission or committee of CDA, or long-standing service at the corporate or specialty section level.

The awards committee will not receive nominations for this award. Recipients will be selected by the committee.

Nominations for Honorary Membership, Distinguished Service or the Award of Merit should be submitted by April 8 to:

**CDA Committee on Nominations and Awards,
Canadian Dental Association,
1815 Alta Vista Drive, Ottawa, ON K1G 3Y6.**

Nominations should be kept in confidence until the final decision regarding awards has been made.

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March/
Mars
1994
Vol. 60
No. 3



A New Era of Dentistry: Patient Education and Case Acceptance

Anita Jupp, Practice Management Consultant

There is much more self awareness in today's world — our focus in the 1990s is on health, with an emphasis on looking and feeling better. This is a look good, feel good generation. All by itself, this singular development has opened up whole new vistas for the dental profession.

As we move toward the future, we need to identify new profit centres in dentistry. At the same time, we must enhance our patients' understanding of their dental care. Educating our patients — "dentally" — is vital to our efforts to heighten case acceptance of optimum treatment. It is also important to be aware of patient needs and to find out what value patients place on their dental health. Your entire team has an important role to play in promoting case acceptance, as the attitude of your office staff affects the potential of your practice. Educating patients through skilful, knowledgeable communication will augment their acceptance of optimum care.

The most successful dental practices are usually built with the same key ingredients:

The right staff — who believe in the dentist's clinical skills and in quality patient care. They are also enthusiastic about the practice and have a positive attitude. Co-workers must relate to each other and to patients in a friendly manner, because patients refer to happy and successful practices. Happy prac-

tices are the result of happy staff.

Organized business systems — are essential. It would be very difficult to enhance case acceptance if there were no systems for prompt follow up on predeterminations, insurance, recall and collections.

A willingness to implement changes. Dental teams need to move ahead and implement new ideas, because you cannot stand still in business today. To stand still is to actually move backwards. Your practice will change when you make the decision to implement new ideas that will benefit patients, staff and yourself. Look at your practice today and visualize where you would like to be in one year, five years, and 10 years. Be prepared, with the help of your team, to implement changes in order to move ahead.

Delegation. I believe that dentists should delegate everything they can (legally of course) to their dental staff. Employees accept their pay cheque because they accept the responsibility that goes with their job and they are accountable for their actions. The dentist should do what he does best — dentistry. Some dentists are not comfortable with delegation and say that it does not work. However, the reason it will not work for them is that they have not taken the time to fully train their dental staff. Do not assume that because someone comes into your practice with 20 years of experience they will communicate

with your patients or organize your business systems in a way that you are 100 per cent comfortable with. Whether you hire a new graduate or someone with many years of experience, you must train your dental team to meet your needs, to have the same goals, and to share your philosophy and technology, so they can communicate with your patients on the level that you feel most comfortable with.

Detailed treatment plans. Treatment plans for elective dentistry should be in phases, and the dentist should also include alternative methods of treatment to present to the patient. These plans should be in the patient's chart so that team members can promote the proposed treatment to the patient. Your dental team cannot promote what they do not know.

One of the most important things you can do in dentistry today is focus on patient education. To focus on education, you must train your team to "talk dentistry." I have found that most offices I visit are very friendly and caring, but 75 per cent of the talking between staff and patients is social and only 25 per cent is related to talking dentistry. Patients do want both you and your staff to be sociable and they do want you to be friendly, but they also want to know about their dental care, they want to be educated about dental treatment and, most importantly, they want you to listen to their dental needs.



Enhancing case acceptance begins with the new patient examination. After the business assistant has reviewed office policies and practice information with the new patient, he or she is shown to a treatment room, and (ideally) the medical history is taken by a dental assistant — chairside. In addition to taking the patient's medical history, the assistant can determine the patient's dental comfort level (on a scale of 1 - 10). She may also ask questions such as: How do you like your smile? What about the color and shape of your teeth? Is there anything about your smile that you would like to change? When was the last time you visited a dentist?

The assistant must listen carefully to the patient and document their conversation. At this point, the assistant can review the patient's dental history (or the dentist can do this, as some prefer). Basic questions can be safely delegated by the dentist to the assistant, however.

Once the patient's dental history has been recorded, the dentist examines the patient and may (depending on the oral condition) diagnose immediate concerns and/or basic restorative needs. This is the time to take note of elective and/or comprehensive dentistry in the patient chart. If the patient has expressed interest in cosmetic work, the dentist may want to take the time to explain these procedures. However, some dentists prefer to wait until the basic restorative and hygiene work has been completed, building a comfortable dentist-patient relationship before introducing elective options.

A green, active tab should be placed on the patient chart. These tags are flags to alert the clinical team to promote the dentist's treatment plan the next time the patient is in the office for a recall appointment. Some of your patients will choose to accept treatment immediately, but others may wait years until they are comfortable with you, your team, and the procedure. Most importantly, they will accept treatment when they value and want it.

It is a good idea to reassess patient needs every three to four years

at a recall appointment. People's attitudes and priorities change over time, and although they may not be ready to accept immediate treatment, they may want the treatment at a later date.

Consistent and Smart Communication Skills

Your dental team needs to have excellent verbal skills and they need to know the latest dental technology. It is very important for everybody on staff to have a clear understanding of the treatment and materials you use in your practice. It's also useful to give the business team an opportunity to observe you and your clinical team in action and gain a grasp of the procedures. This will enable them to relay the importance of treatment, in layman's terms, to the patient.

There are times when the patient will come to the business desk and ask the receptionist, Do I really need that crown?, or Could you tell me what is involved in the next appointment for that crown? Even though the dentist may have explained the treatment, and the chairside assistant may have explained the treatment, some patients just need positive reinforcement from the business assistant. For this reason, the team must be consistent in their knowledge. There must be continuity between the assistants, hygienists and business team when they are talking dentistry. The dentist should list three to five advantages of each treatment in the patient's chart, so that when he or she asks: Why do I need that crown?, or What are the advantages of bonding my teeth?, or What are the advantages of implants?, everybody on your dental team will be consistent in their answers. Some other questions that patients usually ask are: What kind of guarantee do I have?, How long will this last?, What will it look like?, and Will it match the color of my natural teeth? Only the dentist can train his team to talk dentistry in a way that suits his practice and that he or she is comfortable with.

Staff Training

Time should be set aside on a regular basis to provide staff train-

ing for all team members. You may wish to talk about new materials, new techniques or new technology. Your staff must feel comfortable talking dentistry. Providing staff training time will allow your team to acquire new knowledge and skills that will enhance their patient education activities.

Talking Dentistry

Although some provinces are limited in what they allow chairside assistants to do, assistants in all provinces can "talk dentistry." If the dentist is happy with his or her practice, delegates responsibility to the assistant and shows confidence in that individual, then the dentist is also giving the assistant more self-confidence and self-esteem. Better self-confidence and self-esteem create a high-trust environment and that high-trust environment is what keeps patients in your practice.

Selling and "Unselling" Dentistry

A lot of dentists are uncomfortable with "selling dentistry," but they shouldn't be. As a dentist, you are selling people something they need. It's important, however, to sell dentistry in a professional, responsible way. Treatment plans should be introduced through education and by listening to the patients' needs. What you need is the right staff and superb staff training. Your staff need the time to talk with your patients. As dentists, you don't want to frighten your patients, but you should certainly inform them of the consequences of not accepting or completing prescribed treatment. Instead of "selling," you are actually:

- Educating patients
- Introducing treatment
- Listening to patient needs
- Explaining and answering patient questions
- Informing patients of the consequences of not completing treatment
- Being enthusiastic about dentistry
- Talking about the advantages of looking and feeling better

There are a lot of dentists in practice today who actually "un-

sell" dentistry. Instead of encouraging patients to accept treatment, they write little "W's" in the patient's chart above his or her comprehensive treatment needs, which means, "let's watch." What exactly are they watching for? Other dentists write "observe." What are they observing? Does the patient need a crown or not? If you diagnose a treatment need, at least introduce it to the patient. Let your patients make their own decisions. If the timing is right, if they value it, if it's important to them at the time, then they will accept the treatment. You cannot sell what you do not introduce.

The Office Image

Some excellent tools that you and your staff can use to promote elective dentistry include placing before and after photo books in treatment rooms and also in the greeting area. An image system/intra-oral camera will help your patients to understand their immediate treatment needs.

One very important internal marketing tool is your office image. Are all of your staff members well dressed, are there scratched walls or peeling paint in the practice? Is your office tastefully decorated according to the tastes of the 1990s? Patients notice every little detail. They are more apt to accept treatment from a professional-looking staff working in a spotlessly clean and tastefully decorated practice.

Have a professional, friendly image and take the time to listen to your patients' needs. Remember to propose treatment — your patients cannot accept treatment if they have not been informed about it. Patient education, superb communication and a highly-trained, competent staff are your keys to enhanced case acceptance of optimum dental care. ■

Anita Jupp is a well-known practice management consultant, lecturer and author. She has lectured around the world, presenting programs in Canada, the United States, Barbados, Bahamas, England and Scotland, as well as other countries.

The Dentistry Canada Fund

Planned Giving

The merging of the existing CDA charities and trust funds under the name **Dentistry Canada Fund (DCF)** was approved at CDA's 1993 Annual Meeting. The creation of an umbrella organization promises to be a more effective and efficient method of continuing the activities of these charities and trusts and, very importantly, should considerably enhance the funding base required to support these actions.

Planned Giving is being introduced as part of DCF's 1994 Marketing Plan. Planned Giving allows you to make a charitable donation in such a way that you minimize your tax obligations and maximize other financial benefits. As a Planned Giving donor, you give some of your accumulated assets, not merely a portion of your disposable income. The size of the donation will be significant, to both you and DCF.

A Planned Gift recognizes the satisfactory relationship that you have enjoyed, short or long term, in the dental profession. It is your contribution to the future of dentistry.

There are various types of planned gifts:

1. Wills and Bequests

Bequests may be considered by all donors. They are particularly suited to individuals who must conserve their assets during their lifetime, but wish to make a significant gift.

2. Insurance

Almost any insurance vehicle may be designated as a planned gift. In this case, DCF must be listed as the owner and beneficiary of the policy in order for the donor to receive a tax credit. It works two ways. Existing policies may be assigned — a tax receipt will be issued for the cash value of the policy — or a new policy may be taken out, which would make the donor eligible to claim tax credits based on the annual premiums.

Insurance is appropriate for those who wish to leave a legacy but don't have a substantial estate, or those who wish to make a contribution outside of their estate.

3. Annuities

This involves the donor giving DCF a lump sum of money, which is then used to purchase an annuity. This annuity pays an income to the donor, generally for his or her lifetime. Annuities are suitable for those who have a large amount of money to donate, but need to use some of it during their lifetime.

4. Gifts of property

Here, the donor assigns ownership of a property to DCF, but retains the right to use it during his or her lifetime. A tax credit is provided. On the death of the donor, DCF may sell or make other use of the property.

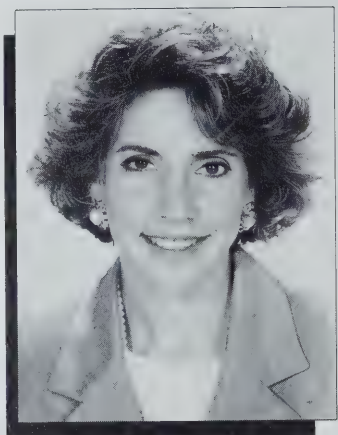
Planned Giving is going to be a vital part of DCF's fund-raising efforts. Please consider making a Planned Gift for the future of Dentistry.

For More Information Contact:
The Dentistry Canada Fund
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JOURNAL

March/
 Mars
 1994
 Vol. 60
 No. 3



Infection Control Considerations When Designing and Equipping a Dental Office

Marilyn C. Miller, DDS

Using new concepts in office design and choosing proper equipment can help protect both patients and staff by reducing the opportunities for microbial cross-contamination. This article describes some general guidelines for enhancing infection control.

General Design Considerations

Office layout can enhance the practitioner's efforts to reduce the spread of infection. By controlling traffic flow in the office, it is possible to minimize the opportunities for cross-contamination to occur. Ideally, consultation, reception and administration areas should be segregated from areas such as operatories, instrument processing, laboratory and radiology. The physical separation of nontreatment areas from treatment and treatment-support areas, combined with proper work practices, segregates contaminated personnel, reducing the risk of infection for individuals not participating in or receiving treatment.

In treatment and treatment-support areas where scrupulous cleanliness is required, careful consideration must go into the selection of the materials used in the walls, floors and cabinetry. Surfaces in these areas should be easy to maintain. Care should be taken to ensure that they contain the smallest

possible number of nooks and crannies, which harbor contaminants and debris. While textured surfaces such as "grass cloth" wallpaper or rough, stone-like laminates may be esthetically pleasing, they needlessly complicate housekeeping. Walls should be covered with durable vinyl wall covering and/or high-gloss, scrubbable paint.

Opinions differ on the subject of flooring, a topic about which neither the Occupational Health and Safety Administration (OSHA) or the Centers for Disease Control and Prevention (CDC) in Atlanta have made recommendations. Tiles, whether ceramic or vinyl, are a poor choice, however, because grout lines and seams invite the accumulation of potential contaminants and are nearly impossible to clean effectively. A sensible alternative is smooth-surfaced, seamless vinyl floor covering, although Demaree and Cunningham¹ make a case for nylon carpet as the flooring of choice in the operatory. They contend that nylon carpet is inherently inhospitable to bacterial colonization and can be treated with antimicrobial agents as a further precaution.

The surfaces of counter tops and cabinetry, including the interior of drawers and cupboards, should be made of smooth, nonporous materials such as vinyl, glass, resin laminates, stainless steel or processed resin products such as Dupont Co-

rian. Making counter tops of preformed, continuous material, with a three- to four-inch back splash, effectively eliminates debris-trapping seams at the front and back edges. Removable shelves and drawers facilitate frequent cleaning and disinfection. The shape of drawer and door pulls, as well as the material used to make them, should be based on minimizing the collection of debris and the ease of cleaning and disinfection. Automatic, concealed touch latches for drawers or cabinets make pulls obsolete and are inexpensive and easy to install.

Sinks with worn surfaces should be replaced with sinks made of smooth materials such as stainless steel, marble or porcelain. Faucets and dispensers for soap or lotion should be activated by foot pedals or automated sensors to provide "hands-free" operation. Waste receptacles can be concealed under the counter top or in a cabinet, and should be accessed through a counter top or cabinet-front cut-out with a generous opening for easy disposal. It is also important to maintain separate, clearly-marked, biohazard disposal containers — one for contaminated waste such as cotton rolls, gauze and tissue packing soaked with blood or other potentially infectious material; one for non-contaminated general office waste; and a third, puncture-resistant receptacle specifically for "sharps."

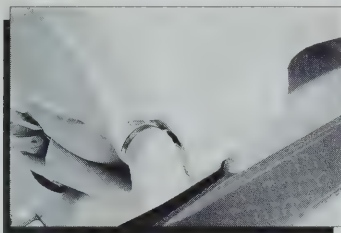


Fig. 1: Detail. Note the seamless upholstery and armrests. (Photo courtesy of A-dec Inc.)

In addition to these general recommendations, some specific guidelines pertaining to certain key functional areas of the dental office can also aid the practitioner in developing a comprehensive infection control program.

The Operatory

Treatment rooms can now be designed to meet two essential requirements: efficient patient treatment and effective infection control. Increasingly, dental professionals are regarding the treatment room as a dedicated facility, comparable to a hospital operating room. Streamlining the contents of the operatory makes maintaining asepsis easier. Accordingly, bulk storage and instrument sterilization are relegated to other areas of the office. But even when it's reduced to the bare essentials, the operatory remains the most challenging environment in a dental office from an infection control standpoint.

Cross-contamination in the dental office often occurs as the result of touching various surfaces and items with contaminated hands. One way to help simplify between-patient clean-up is to cover frequently-handled items like control switches, knobs and levers with impermeable barrier materials such as plastic film, plastic bags and metal foil. These barriers are changed between appointments.

Foot-operated controls also help to reduce the potential for cross-contamination. In most cases, patient chairs with fingertip controls can be retrofitted with foot-operated controls. The next best alternative is to use a sticky-sided plastic barrier over chair-mounted controls, and change the plastic between patients. Chair surfaces should be made of durable materi-

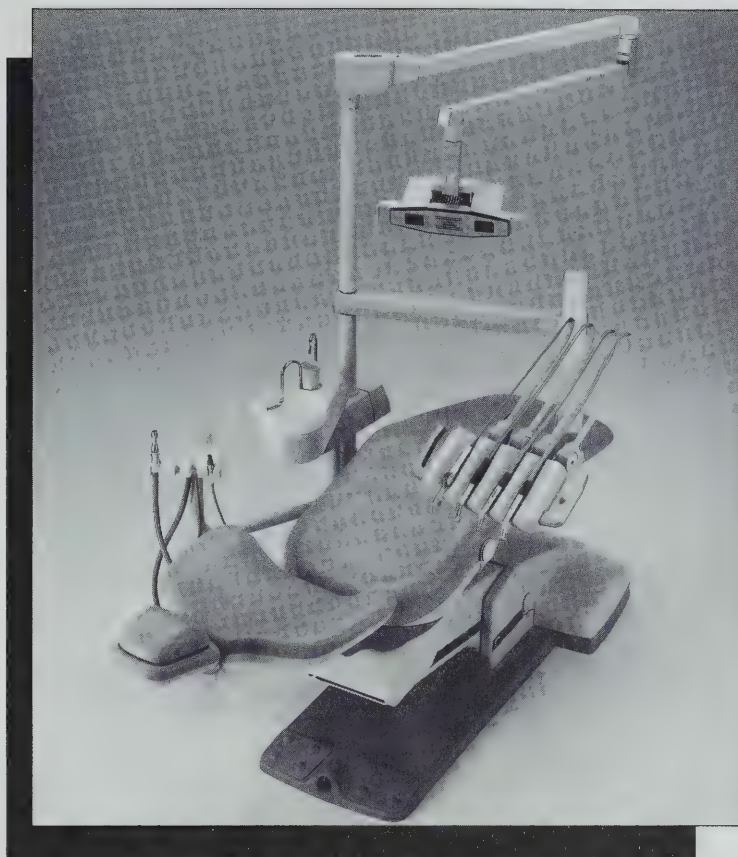


Fig. 1: Unit designed to simplify asepsis. Note the foot and touch controls. (Photo courtesy of A-dec Inc.)

als designed to withstand routine disinfection, and chairs should be upholstered in moisture-proof, seamless material. Headrests should be covered with fresh, disposable barrier material for each patient, and the chair wiped clean between appointments with an appropriate disinfectant. The operators' stools should also be covered in moisture-proof, seamless upholstery, and have foot-operated controls. If foot controls are unavailable, hand controls should be barrier protected or disinfected.

Lights and portable carts are easily contaminated through frequent handling and adjustment. Newer overhead lights feature foot-controlled on/off switches and/or removable, sterilizable handles. Disposable barrier materials should be used to cover the controls and handles on older models. Operatory carts should be smooth and seamless on both the top and underside. A handle allows the operator to

move the cart without touching and contaminating its underside and edges. Carts should be covered with barrier materials that are removed after treatment. Carts without barriers should be disinfected between patients.

Equipment such as high-volume evacuators and air/water syringes should be smooth and seamless to facilitate cleaning. Hose ends and connector assemblies should be thoroughly rinsed, scrubbed clean with detergent, and disinfected after each patient. Suction tubing should be flushed between appointments with fresh water, and at the end of the day with a non-foaming cleanser and disinfectant. Tubing should be straight and smooth—coiled tubing is difficult to clean.

Water tubing is of particular concern due to the potential for microorganisms to accumulate on its inside surface, especially in equipment fitted with retraction or "suck-back" devices to keep water

from dripping on patients. The following method is recommended for testing the water retraction of all water systems: "Run a turbine handpiece for a few seconds in a dye solution, leaving the head immersed for five minutes. Then disconnect the handpiece from the hose, hold the connector over a white paper towel and activate the unit; any dye in the water from the connector is evidence of water retraction. To remedy, install a one-way valve in the water line."²

Equipment manufacturers are seeking innovative ways of addressing existing infection control problems. At least one manufacturer now markets a dental water-supply unit with a built-in decontamination system that flushes water tubing with glutaraldehyde.³ A second company supplies sterile water for surgery and markets a system that disinfects handpiece water using ultraviolet radiation.

In recent years, guidelines for the control of cross-infection through dental handpieces have been developed and well-publicized by the American Dental Association (ADA), the Food and Drug Administration (FDA) and the Centers for Disease Control and Prevention (CDC). These guidelines all indicate that the surface disinfection of handpieces is not adequate, stating that it is necessary to sterilize handpieces between uses.³ Manufacturers are responding to the need to sterilize handpieces by designing new models that can withstand sterilization under heat and pressure, and are easier to disassemble.

Instrument Sterilization Facilities

Separate facilities should be set aside that are used exclusively for sterilizing instruments. The expense and scarcity of office space make it tempting to combine this area with operator or laboratory space, but to do so undermines the office's infection control efforts.

The space designated for instrument sterilization should be organized into functional zones according to a logical work flow: a receiving area for incoming dirty items; a clean-up area with a large sink; an



Fig. 2a & b: Disposable barrier materials can include special headrest covers as well as light and handle wrappings.

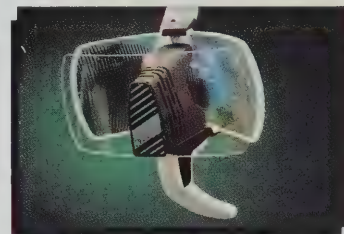
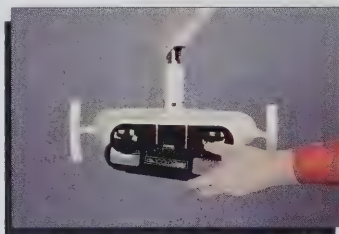


Fig. 3a & b: Overhead lights with removable sterilizable handles and shields.

ultrasonic cleaning device, with adequate space to dry, sort and pack items for sterilization; an area for both heat and chemical sterilization units, with a cool-down area (such as a cupboard or drawer) that encourages prompt unloading of the sterilizer and prevents a backlog of items to be processed; and an area for storage and tray assembly. The sterilization area should also be equipped with a ventilation system designed to exhaust any hazardous fumes generated during sterilization processing.

The efficient operation of the instrument sterilization area requires ample work and storage space. Space recommendations range from 16 to 24 linear feet of counter top and cabinets, depending on the size and patient flow of the office. Also, depending on the dimensions of the room and the particular requirements of the office, this space may be configured in two parallel runs, i.e. as an L-shape or a U-shape.

As for the sterilization equipment itself, current models offer a variety of improvements over their predecessors, with faster cycle times, microprocessor-controlled settings, self-diagnostics and built-in safeguards.

The Laboratory

In-house laboratory functions should be assigned to a distinct

area in the office, which provides separate work zones for disinfecting impressions and models, pouring and trimming models, final model preparation, lab work and finishing. This not only segregates equipment such as lathes and handpieces from wet areas, but also minimizes opportunities for cross-contamination. A vacuum unit should be placed close to where cutting and trimming operations are performed to contain debris and particulates.

Future Considerations

Heightened concerns about the efficiency and effectiveness of infection control in the office environment have resulted in the development, and growing availability, of equipment and furnishings designed to minimize crevices that can trap dirt and shelter microorganisms. Manufacturers are also responding to user needs with products that are easier to disassemble, clean thoroughly and reassemble. New generation products are better able to withstand the rigors of frequent decontamination procedures, and include features like foot-operated controls or flush-mounted, membrane-covered switches that help to limit opportunities for contamination.

Tomorrow's materials for dental equipment, surfaces and instruments may be covered with antimicro-



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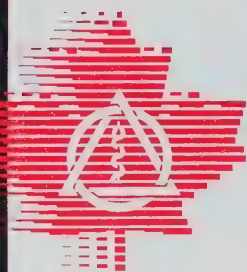
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- Overview of major career stages
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- Setting realistic goals for practice growth
- Marketing & growth strategies
- Scheduling & appointing strategies
- Introduction to practice transitions

Volume 2 • Associate and Transition Planning

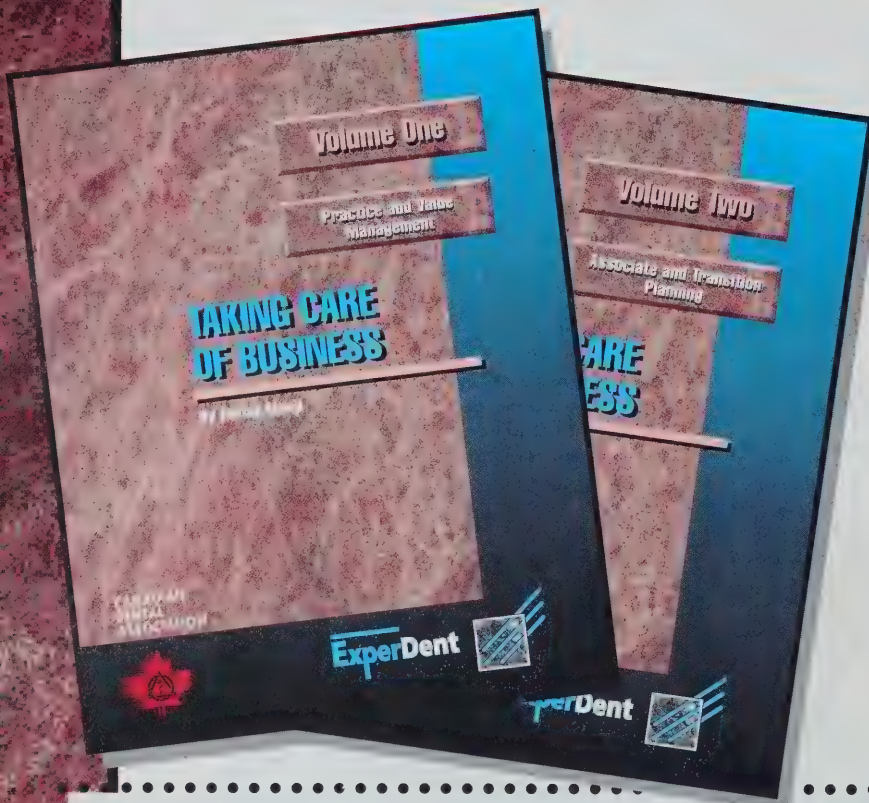
This volume provides the most up-to-date reference on practice transitions that can be found! Transitions include crucial events in the career of a dentist such as starting a new practice, becoming an associate, hiring an associate and retirement. *Associate and Transition Planning* reveals all the factors that you must consider during these exciting events, and gives you straight-forward advice to maximize your success! Key areas:

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- The dental career cycle
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crobial coatings. Another developing concept — employing non-stick electrostatic or super-slick chemical coatings — will make it more difficult for microorganisms to gain a foothold on walls, floors and counter tops.

Dentists can expect a continued trend toward streamlining the contents of the dental operator. The fewer the items in the room, the fewer the items requiring decontamination between appointments. This may lead to a more modular approach in the design of equipment such as lasers, ultrasonic scalers and curing lights. The base components of tomorrow's equipment may be housed outside the operator, leaving only the working components and a remote-control device in the treatment room.

Eventually, efforts to contain contaminants in the dental office may lead to treatment rooms being routinely outfitted with sterile water supplies, zoned heating, air conditioning and ventilation systems, and laminar airflow patterns designed to reduce the flow of airborne bacteria generated by hand-piece drilling and laser treatments.

Future products will have more built-in safeguards. Sterilizing equipment, for example, will feature automatic biological monitoring. Dental instruments and personal protective equipment will have indicators that will change color to signal the presence of microbial contaminants.

The trend toward hands-free equipment will also continue, making greater use of technologies such as voice activation, infra-red remote control and motion sensors. It may even be possible, some day, for the dentist to perform hands-off dental treatment — a computer-controlled robotic arm will carry out the dentist's instructions, and the dentist won't even touch the patient.

The combined effect of these developments will make it easier for dental professionals to comply with an appropriate infection control program designed to protect both recipients and providers of dental health services. ■

Acknowledgements: We would like to thank **Dr. John M. Young**, clinical professor and director of research at the University of Texas Dental School, as well as **Dr. Bruce Bloom**, director, Dental Loss Control Services, CNA Insurance Companies, for their assistance with this article.

The opinions expressed herein are those of the authors, and do not necessarily represent the opinions of CNA Insurance Company.

We would also like to thank A-dec; Proma, Inc.; DENTAL-EZ, Inc.; and Planmeca, Inc. for the photographs used to illustrate this article.

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Dr. Marilyn C. Miller is co-director of the Princeton Dental Resource Center.

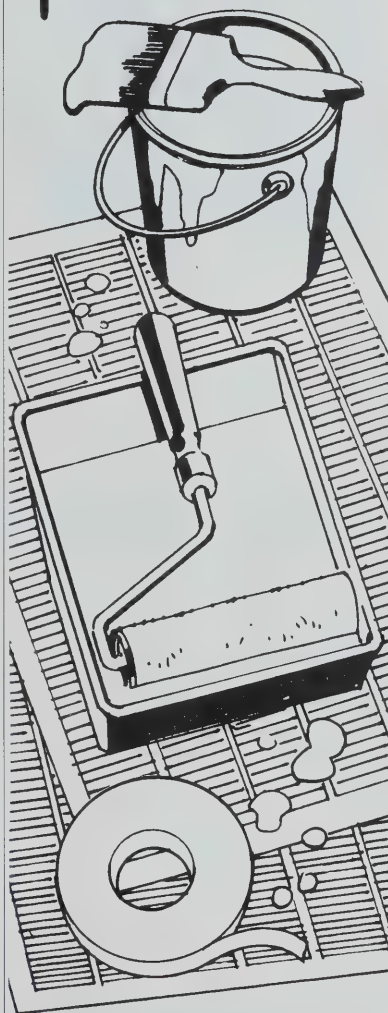
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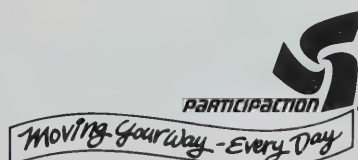
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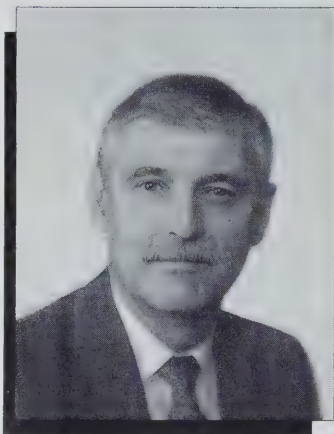


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JOURNAL

March/
Mars
1994
Vol. 60
No. 3



Informed Consent — The Process

Jim Commerman

In my travels, I have had an opportunity to talk with dentists from across Canada about informed consent and their understanding of the process. These discussions have convinced me that the vast majority are unclear about what is entailed in obtaining informed consent.

Most dentists believe that informed consent entails asking patients to sign a declaration form indicating their consent to treatment. While declaration forms are important, they may have no value at all if the proper process of obtaining informed consent has not been followed. In Ontario, for example, Bill 109 clearly defines what is meant by informed consent...

Definition

"A consent is *informed* if, before giving it:

a) the person *received* the information about the treatment, alternative courses of action, the material effects, risks and side effects in each case and the consequences of not having the treatment that a reasonable person in the same circumstances would require in order to make a decision; and

b) the health practitioner responded to the person's requests for other information about the treatment, alternative courses of action, material effects, risks and side effects, and consequences of not having treatment."

Two words in this definition are exceptionally significant — "informed" and "received."

Informed indicates that expert advice must be given to the patient before his or her consent can be assumed. In essence, this demands that practitioners provide a form of patient education. The word's use is therefore relatively easy to understand. Very few, if any, dentists would be pleased to hear their patients say, following treatment: "If I had known that, I would have done this." In fact, this statement symbolizes the emotions of an uninformed patient.

The use of the word *received* is equally important. It indicates that the patient is not required to "volunteer" any information to the practitioner. In essence, under the law, the practitioner is regarded as the "expert," and is therefore expected to ask the patient pertinent questions, recommend treatment alternatives, and counsel the patient on any risks that may be present. When it comes to knowledge of their own bodies, the law assumes ignorance on behalf of patients. At the same time, it places the onus on the practitioner to ask the proper questions of the patient prior to recommending and providing treatment.

So, how does the prudent and conscientious dentist implement this process into a busy practice.

Capacity

The very first thing the dentist should do is ascertain who has the authority to provide legitimate consent. As the rules surrounding both the age of consent and guardianship can vary from region to region, it is important for dentists to be fully informed about the regulations in their area.

Material Effects, Risks and Side Effects

Asking the patient to provide a very thorough and specific health history is strongly recommended. Some practitioners may find this process difficult, but it is a key step in obtaining informed consent. To illustrate, a very difficult question to ask is: "Are you drug dependent?" Most drug-dependent patients would probably respond untruthfully to this question, even though a cocaine user could suffer cardiac arrest if the practitioner administered an injection of anesthetic to numb an area of his or her mouth. Regardless of the patient's response, however, as long as the practitioner asks the question, no liability will result. Conversely, if the question is not asked, and the worst case scenario occurs, the court would probably rule that consent had not been given, as the patient was not advised of the risk.

Being specific is also very important. For example, lawyers con-

sider the question, "Do you have a heart condition?," to be too indefinite. I recently spoke with a dentist at a convention, one of my clients, in fact, who advised me that he had recently been diagnosed as having a mitral valve prolapse. So I asked him if he would describe himself as having a heart condition. His reply was: "no."

Patients with hip and joint replacements inevitably ask what this has to do with their teeth. Don't rely on the patient's physician to advise the patient to be premedicated prior to dental treatment — it may put you at risk. In fact, determining risk should be an essential design consideration in developing a thorough health history questionnaire. My experience has been that dentists would rather ask less than more for fear of annoying the patient. Perhaps dentists should ask themselves if the patients who protest against completing a health questionnaire are really that interested in having their health treated or their teeth fixed. Is this patient educated, and wouldn't this same patient be one of the first to complain about other circumstances regarding their treatment if there was a problem?

Alternative Courses Of Action

Another part of the informed consent process involves presenting treatment options. Let's say that a patient presents with tooth No. 16 missing. While the most obvious treatment would probably be to place a bridge between Nos. 15 and 17, the definition of informed consent makes it clear that a partial upper denture, an implant, or no treatment at all are alternative courses of action of which the patient should be advised.

Consequences

Should the patient decide not to go ahead with any treatment, he or she should be advised that Nos. 15 and 17 may wander, causing an occlusion problem with possible subsequent headaches. In other words, the patient must be alerted to the possible consequences of refusing to accept treatment.

Ability to Ask Questions

Finally, a declaration signed by either the patient, the parent or the guardian, or the person in authority, should state that the opportunity to ask questions and receive answers to any questions was furnished prior to treatment.

When all of these steps have been completed, informed consent will have been achieved.

By this time, you are probably wondering whether the process of obtaining informed consent will turn your practice into a paper chase. It won't — experience has proven otherwise! Patient records can be designed, and are already available, that are very efficient with respect to recording and retrieving essential information. Clients who use these systems advise that it takes patients around 12 to 18 minutes to record the necessary information, and that when the

document is properly presented, less than one per cent of patients object in any way to its thoroughness. Furthermore, providing a detailed medical and dental history helps to educate the patient about the health procedures they are about to experience, creating an informed and approachable patient. This has resulted in a higher ratio of treatment acceptance to case presentations, and less emphasis on insurance coverage and cost in the design of the treatment plan. A knowledgeable patient can be the solution not only to securing true informed consent, but also to a successful, fulfilling practice.

Mr. Jim Gommerman is an independent businessman and president of JMR Business Systems located in Burlington, Ontario. He has been associated with dentistry for almost 25 years.



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March/
Mars
1994
Vol. 60
No. 3



Would You Recognize Fraud In Your Practice?

Gary Marcus, CA

Billions of dollars. That's what fraud is estimated to cost corporate Canada. From financial institutions to charities, white collar crime affects virtually every type of business — including dental practices.

Newspaper headlines like, "Bookkeeper Steals \$18,000 from Dental Practice"; or "Receptionist Dupes Unsuspecting Dentist of \$30,000," are all too common. What is particularly worrisome is that these cases represent only the tip of the iceberg. For every case of fraud that is discovered and prosecuted, dozens of other perpetrators are never caught.

Theft, fraud, and embezzlement is occurring in dental practices across Canada as I write this article — and most of it will never be discovered, or if it is, only after the culprit is long gone. Furthermore, fraudulent activity is expected to increase as economic pressures continue.

No matter how small your practice or how long your staff has been working for you, given the right circumstances, virtually any one of your employees might steal from you. When predicting the possibility of white collar fraud, the 10-80-10 rule is often cited: "10 per cent of people will steal anytime, 80 per cent will steal if they think they can get away with it, and 10 per cent will never do it."

While most employees are basi-

cally honest, it's important to recognize that a significant percentage could steal, given an opportunity, a rationalization and an expectation that they would not be caught. Even loyal, trusted employees may be tempted to defraud an employer if they face a financial crisis. And with many practices cutting back on staffing these days, the pressures on employees are growing every day.

To ensure that you don't tempt fate or your employees, you can install a number of safeguards. You should be aware of the two most common types of theft that occur in dental practices — and of the strategies for preventing them from happening to you.

Lapping refers to the concealment of cash shortages by delaying the recording of cash receipts. For example, a bookkeeper collects funds from patient A, but holds onto them and doesn't credit them to the account. He or she subsequently collects funds from patient B and credits them to patient A. That individual repeats the same procedure with the payment from patient C, crediting it to the account of patient B. This results in an overstatement of the accounts receivable. If the bookkeeper carefully shifts this overstatement, the dentist may never discover the theft.

You can prevent lapping in your practice by establishing three procedures:

1. Send monthly statements to patients with outstanding balances. Delegate this task to someone who does not have responsibility for recording accounts receivable.
2. Personally verify the accuracy and completeness of the statements by reconciling them to the accounts receivable.
3. Separate the tasks of collecting funds and recording accounts receivable, i.e. delegate them to two different individuals.

Kiting involves hiding cash shortages through bank deposits. When a cheque drawn on Bank A is deposited to Bank B, for example, it usually takes several days for Bank A to receive notification of the withdrawal. If the transfer takes place toward the end of the month, this could result in an overstatement on your statement from Bank A.

In theory, your ledger for Bank A should reflect an outstanding cheque or transfer. Therefore, it would be recorded in your books but, because of the timing discrepancy at the monthly cut-off date, not in the bank statement.

In a kiting fraud, however, the bookkeeper would omit this outstanding item, and the dentist is unlikely to notice the discrepancy unless he or she reviewed the first few withdrawals recorded on the next month's bank statement.

To prevent this situation, you

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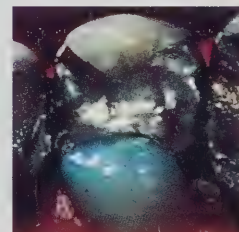


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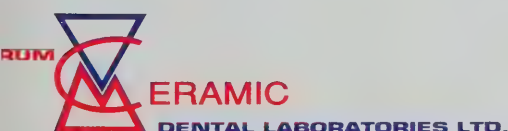


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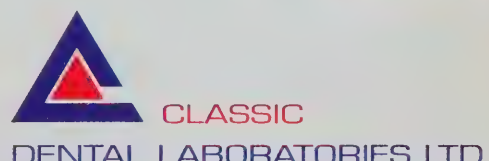


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should take personal responsibility for reviewing the detailed bank reconciliation for your practice and at least the first few withdrawals on each month's bank statement, to ensure that they are not the result of unreconciled inter-bank transfers.

While no business is immune from these problems, taking firm, personal command of your operations and implementing comprehensive internal controls will go a long way toward avoiding trouble.

In addition to the specific measures already described, there are three categories of general controls that will help to prevent most types of fraudulent activity. These are appropriate to any size of dental practice — from a sole proprietorship to a multi-professional, multi-location business.

Basic Controls

Some of the basic controls, representing sound business practices, that should be implemented by every organization are:

- Inform all employees that you have established secure internal controls to prevent any financial problems. Encourage them to come to you if they notice discrepancies in regular financial transactions or records.
- When hiring a new employee, ask for references and verify them.
- Obtain insurance bonding for employees with access to funds or financial-based assets.
- Store assets, financial records and all unused cheques in a safe or locked cabinet.
- Use only pre-numbered cheques. When reconciling statements, verify personally that they are all accounted for.
- Retain and mutilate all voided cheques.
- Do not allow the use of cheques payable to cash.
- Implement a security access system for computerized records.
- Establish regular back-up routines and off-site storage for all computer records.

Segregation of Duties

While many businesses have reduced staffing in an effort to save costs, it is important that certain

duties remain segregated to avoid situations receptive to financial abuse. For example, you should:

- Ensure that your employees take regular vacations. When an individual is away, appoint another person to carry out his or her tasks.
- Allocate responsibility for recording invoices and accounts receivable to one person, and make another person responsible for opening mail and preparing bank deposits.
- Designate purchasing duties to someone other than the bookkeeper. Also, ensure that only pre-numbered purchase orders are used and that they are approved by someone other than the purchaser.
- Assign someone who is not involved in the accounts payable function to mail signed cheques.

Personal Involvement

To successfully avoid fraud in your practice, you must not only be aware of the potential for fraud to occur, but you must also be personally involved in its prevention. These are some of the responsibilities that dentists-owners should assume:

- Sign cheques only after reviewing supporting documentation such as invoices, approved purchase orders, or delivery notes. Stamp these documents "paid" to prevent duplicate payment.
- Review all bank statements before passing them on to the bookkeeper.
- Review bank reconciliations monthly.
- Establish a petty cash fund with a defined transaction dollar limit. When approving replenishment, review all supporting receipts.
- Review reduced fees, courtesy discounts, write-offs and transfers between files and approve them in writing.
- Examine all aging accounts receivable, collection percentages, and collection periods monthly.
- Approve all purchases over a predetermined amount.

Finally, be vigilant in maintaining, assessing, and enhancing the

controls you have established. No one can afford to be complacent about eliminating the potential for fraud or theft. Just as business is becoming more sophisticated, so is criminal activity. Be on the lookout for warning signs such as:

- employees experiencing personal financial pressures;
- poor employee morale;
- strains on staffing;
- disorganized record keeping and files;
- a higher number of year-end journal entry adjustments; and
- lower sales and income combined with higher accounts payable and receivables.

While controls must be personalized for every dental practice, the time and financial investments involved are minimal compared with potential losses. Get serious about fraud prevention. Consult with a professional financial adviser for assistance in establishing effective internal controls, and be prepared to participate personally in implementing and monitoring them. ■

Gary Marcus, CA, is a partner of Orenstein & Partners, a Toronto-based chartered accounting firm and member of Horwath International, with affiliated offices across Canada and worldwide. Gary provides accounting, tax and consulting services to entrepreneurs and professionals including dentists, doctors, and lawyers.

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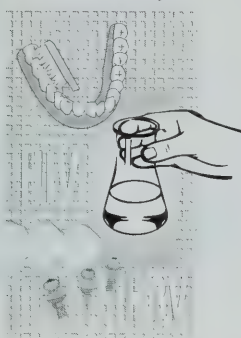
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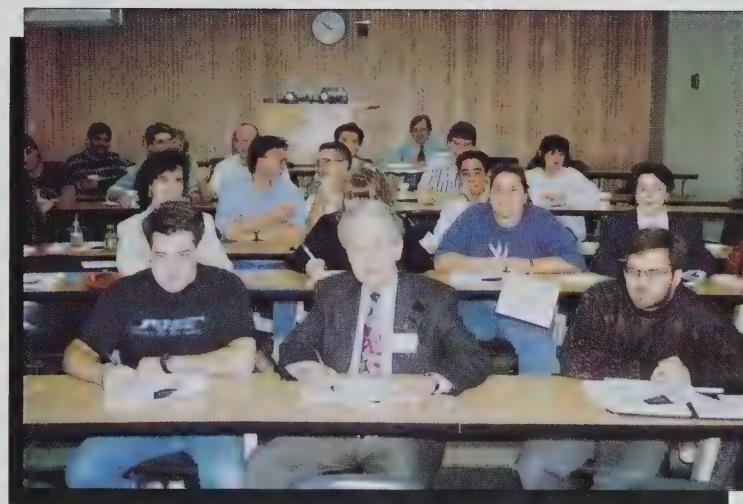
P. Ralph Crawford, BA, DMD

A few months ago, I returned to my roots. Not only did I go back to dental school, but I occupied the very same seat in the very same lecture theatre where I had attended classes more than 30 years before.

While I found the experience interesting, I didn't return to my alma mater, the University of Manitoba, to reminisce or recall days long past. Actually, I went back to participate in CDA's new lecture series — *Taking Care of Business, Your First Five Years* — which was being presented to the dental faculty's fourth year students. It's an exciting program that I would strongly recommend to every dental student and dentist in the country.

CDA and ExperDent

The seminar project is a cooperative effort between CDA, Canadian Dental Insurance Plans Inc. (CDSPI) and ExperDent Consultants of Burnaby, B.C. It owes its success to the ingenuity of Ms. Linda Teteruck, CDA's director of communications, and Mr. Imtiaz Manji, the president of ExperDent. Together, they recognized that graduating dental students, as well as dentists in their early years of practice, require all the help they can get to succeed in the "business" of dentistry. Thus, *Taking Care of Business — the Essentials*



Journal editor Dr. Ralph Crawford returns to the classroom for CDA's *Taking Care of Business* seminar.

in *Practice Management for Your First Five Years* was born.

To date, the seminar has been presented to eight of Canada's 10 dental faculties, and presentations are now being scheduled at the remaining two schools. In fact, the program owes much of its success to the support it has received from dental school deans and the faculty members responsible for practice management courses across the country.

Depending on the time available at individual schools, the complete seminar program spans one or two full days. It is presented on behalf of CDA by the ExperDent team: Mr. Manji and his associates,

Dr. Thomas Snyder and Mr. Barry McNulty.

Mr. Manji, ExperDent's founder, writes a monthly practice management column for the *Journal* ("Practice Management and Success") and has lectured extensively throughout North America. Dr. Snyder, who holds an MBA along with his dental degree, is likewise well known on the dental lecture circuit. Mr. McNulty, a registered financial planner from Toronto, has been a familiar figure at Canadian dental meetings for many years, and has written numerous articles on personal finance for *Ontario Dentist*. Together, the three men present a well-rounded, balanced

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1994
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program of sound business principles and personal finance.

What I Learned, Then and Now

Sitting in the same seat that I occupied in my student days, I was reminded of what the world of dentistry was like in the early 1960s. Times have certainly changed. When I graduated, I'd never used a high-speed handpiece, composites were unheard of, and pantographic radiographs were the wonder of the day. Implant dentistry was talked about, but the 80 to 90 per cent failure rates of the early implants scared most dentists away.

In my day, certainly, dental students were required to take courses in practice management that introduced us to simple bookkeeping regimens, office decorum, ethics and jurisprudence. But no one felt any real urgency to come to grips with the business of dentistry, nor was there any apparent need to.

When I graduated in 1964, every one of us had an office to go to. Not one of my classmates bothered to buy someone's good will. Why would they. The day I started practise, I was booked solid for the next three weeks and the patients never stopped coming.

But that was the 1960s and today is now. And now is very different. Today's new graduates face an uphill battle to establish themselves in the profession. That is why *Taking Care of Business* is so vital to the emerging dentist.

Throughout the two-day seminar, I and my new classmates — 25 of the friendliest fourth year students you could imagine — were taught much of what it takes to get started in this tough economic world. Mr. Manji and Mr. McNulty, using an enjoyable, informal approach, led us through a multiplicity of topics. They addressed career goals and options, associateships, buying and starting a practice, partnerships, key management systems, financial basics, patient management, case management, appointment control, payment control and staff management. A 35-page course outline, distributed at the start of the presentation, allowed us to follow the



Practice management consultants confer during the CDA seminar (left to right): Barry McNulty, personal financial consultant; Dr. Jack Stockton, director of practice management program at University of Manitoba; Imtiaz Manji, president of Exper-Dent; Dr. Gerard Bouger of Laval University.

rapid-paced slides and dialogue, and both seminar leaders encouraged questions.

What did we learn? At the end of the seminar, each participant was asked to complete an assessment critique. Here are some of their comments: "This is the best practice management package I've encountered...; an excellent program for job placement, would recommend it...; you can't be a successful dentist with just clinical skills...; good interaction, good lecturers with excellent knowledge of practice management."

The pattern of responses from each dental faculty is the same — *Taking Care of Business* is a winner.

What Follows

As it is impossible to fully cover a subject like dental practice management in a one- or two-day seminar, all the material covered in the lectures is currently being published in two self-help work books: *Taking Care of Business*, Volumes 1 & 2. These books are being provided as a CDA membership service to all new graduates who maintain their membership on into practice. And as the course materials are as relevant to the established practitioner as they are to new grads, they will also be available to the full profession at special mem-

ber/nonmember prices. Watch for more information in the *Journal* and CDA's members-only *Communiqué*, or call CDA, toll free, at: 1-800-267-6354.

Surviving and Thriving in the '90s

Reaction to the initial student presentations has been so positive that CDA is now making a modified form of its *Taking Care of Business* seminar available to the general dental community. Known as *Surviving and Thriving in the '90s*, the new seminar was presented in Ottawa and Toronto this February, and plans are in place for Mr. Manji and Mr. McNulty to "take the show on the road." Dentists interested in attending the seminar are asked to phone CDA's membership services desk at 1-800-267-6354.

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ABSTRACT

It has long been questioned whether antibiotics, used as a supplement to traditional therapy, provide any lasting benefit in the treatment of chronic periodontitis. This study was designed to evaluate Spiramycin as an adjunct to scaling and root planing in the treatment of advanced chronic periodontitis.

In total, 193 patients with advanced periodontitis were recruited in seven centres using selection criteria previously described.¹ After undergoing thorough scaling and root planing, all patients randomly received either Spiramycin, 1,500,000 international units, twice per day (IU, bid) for 14 days (96 patients), or a visually-identical placebo capsule (97 patients). The clinical parameters measured were plaque index, crevicular fluid level, probing depths, bleeding on probing and attach-

ment level changes. Data was recorded at baseline, two-, eight-, 12- and 24-weeks visits.

A total of 189 patients completed the study (96 placebo, 93 Spiramycin). Statistically significant differences in probing depth, favoring Spiramycin, were seen at two weeks ($p < 0.0125$), eight weeks ($p < 0.0020$), 12 weeks ($p < 0.0032$) and 24 weeks ($p < 0.0075$). Spiramycin also produced a significant improvement in attachment level at 12 weeks ($p < 0.0146$). All other clinical parameters showed no difference between drug and placebo.

This study shows that Spiramycin, as an adjunct to thorough scaling and root planing, provides a statistically significant improvement in probing depths for up to 24 weeks when compared with scaling and root planing alone. Both longer studies and microbiologic evaluations are necessary to deter-

mine whether a more lasting benefit is possible.

Key Words: Periodontitis, antibiotic, spiramycin, antimicrobial

SOMMAIRE

Il a été longtemps question si l'utilisation d'antibiotiques produit un effet durable lorsqu' utilisé comme complément au traitement conventionnel des maladies parodontales. La présente recherche a été menée pour évaluer la Spiramycine comme complément au surfaçage radiculaire dans le traitement des parodontites chroniques avancées.

193 patients souffrant de parodontite chronique ont été recrutés dans 7 centres utilisant les critères de sélection décrits précédemment.¹ Tous les patients ont reçu un surfaçage radiculaire minutieux et ont été sélectionnés au hasard pour

The First Oral Cancer Diagnostic System



BEFORE ORASCAN There is a vague area on the right posterior tonsillar pillar which was not observed during a clinical examination of a patient with carcinoma of the left tonsillar pillar.



AFTER ORASCAN Staining with OraScan shows a previously undetected stippled area on the right posterior tonsillar pillar. Diagnosis: carcinoma. Note: Staining on the dorsum of the tongue is typical with OraScan, and is not a positive stain.

Survival rates are improving for every type of cancer except one: oral cancer. The reason is simple: oral cancer is not being detected at an early stage.

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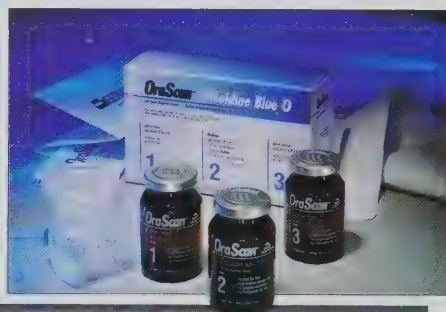
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OraScan focuses the professional's attention on abnormal cells in the oral cavities of patients at risk—those over forty who use tobacco or abuse alcohol. OraScan promotes early diagnosis and treatment of oral cancer. It is also ideal for biopsy site selection because of its sensitivity and accuracy.

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In Sault Ste. Marie, Ontario, Dr. Harvey Snider, DDS, has used OraScan for the identification of an asymptomatic cancerous lesion. Dr. Snider OraScan'd a patient of about 50 who is a smoker and drinker. A suspicious lesion in one area of the hard palate raised Dr. Snider's concern. With OraScan, that area did not stain (it was negative), but another area on the other side of the palate, which had gone unnoticed, did stain and was proven upon biopsy to be a very early stage squamous cell carcinoma of about 3x4 mm.

OraScan Shows 100% Sensitivity for Oral Cancer in New Clinical Study

In a clinical study using OraScan, two British cancer experts have documented the diagnostic's extraordinary sensitivity. Newell Johnson, Nuffield Professor of Dental Sciences at the Royal College of Surgeons and Saman Warnakulasuriya, both of Kings College School of Medicine & Dentistry, used OraScan on 102 at risk patients in Sri Lanka and Pakistan where oral cancer is the #1 cause of cancer-related deaths. All subjects had potentially malignant lesions or conditions of the oral mucosa. Patients were first given a routine visual examination; then the OraScan rinse sequence was used and a second examination was conducted to look for stained lesions. The study found:

1) All 11 carcinomas observed by the experts were confirmed by the OraScan stain. "All clinically suspected carcinomas stained deep blue with excellent marginal demarcation. ...The OraScan kit recognises clinically apparent carcinomas with a

100% sensitivity... We conclude no false negative results were seen in carcinomas."

2) OraScan stained an additional 12 non-macroscopic (non-visible) lesions. Upon further examination, 5 of these demonstrated microscopic dysplasia [a likely pre-cancerous condition]. "The 5 dysplastic lesions solely detected by the dye test suggest that the OraScan kit is valuable for surveillance of the oral cavity in high risk subjects in addition to remarkable ability to have a high sensitivity in detection of invasive carcinomas."

The U.K. Working Group on Screening for Oral Cancer & Pre-Cancer Reports

Recognizing that "poor survival [among oral cancer victims] is due almost entirely to a failure to detect early lesions," a distinguished group of United Kingdom researchers, professors and specialists is preparing a national policy recommendation for the British government. In their interim report published June 1993, the Working Group notes:

Oral cancer mortality is "comparable to that of breast and invasive carcinoma of the uterine cervix in females, and greater than that of melanoma, to name three common cancers which attract much more media attention and public concern."

"Not only is there great variation in the clinical appearance of oral cancers — from classical indurated ulcers to erosive, speckled, white and verrucoid lesions — but whilst some may be preceded by a recognizable pre-invasive state it is thought that others arise against a background of clinically normal mucosa."

"Does detection of small lesions of oral cancer or precancer significantly improve the prognosis for any individual patient? The answer to this questions must be yes. ...Not only do smaller tumours have a better prognosis with regard to

increased chance of survival and prolonged survival time, but the smaller tumours are easier to remove with surgery alone. This will reduce morbidity which is inevitably associated with radiotherapy and recurrences."

"Where it is difficult to decide which is the most appropriate area for biopsy, in vivo staining may help... Staining with toluidine blue [OraScan] ... may stain the most suspicious areas and indicate these which need to be biopsied. Oral carcinoma in-situ and early invasive carcinoma have an affinity to retain toluidine blue dye."

Cancer Brochure for Patients Available Free

Call Germiphene Corporation (800-265-9931) for a supply of free brochures called "Oral Cancer — Are You at Risk?" Available in English and French, this informative piece helps patients understand the causes and implications of the disease, and prepares them for the OraScan test. The brochure provides an excellent focus for newspaper, radio and TV interviews. It can also be mailed to patients and distributed at community health programs.

FREE Oral Cancer Videotape

Two acknowledged Canadian oral cancer specialists, Dr. Joel Epstein, Division of Dentistry, British Columbia Cancer Agency and Dr. Benoit Lalonde, Specialist in Oral Medicine, University of Montreal have helped develop an educational video on oral cancer. While oral cancer is easy to treat when found early, the sobering truth is that 60% of oral cancer is advanced at the time of diagnosis. The videotape also demonstrates how OraScan, a new diagnostic, can identify pre-cancerous lesions and help in biopsy site selection.

To get your complimentary videotape entitled "Oral Cancer Diagnosis" call Germiphene Corporation at (800-265-9931).

recevoir Spiramycine 500 mg b.i.d. pour 14 jours (96 patients) ou un placebo identique en forme et en couleur (96 patients). Les paramètres cliniques suivants ont été mesurés: indice de plaque, quantité de liquide crévicaire, profondeur des poches au sondage, saignement au sondage et changement du niveau d'attachement. Les paramètres ont été mesurés à partir d'un point fixe avant le traitement et à 2, 8, 12 et 24 semaines après le traitement.

189 patients ont complété la recherche (96 placebo, 93 Spiramycine). Une différence statistiquement significative concernant la profondeur des poches au sondage favorisant la Spiramycine a été remarquée à 2 semaines ($p < 0.0125$), 8 semaines ($p < 0.0020$), 12 semaines ($p < 0.0032$), et 24 semaines ($p < 0.0146$). Tous les autres paramètres cliniques n'ont indiqué aucune différence entre le groupe traité avec la Spiramycine et le groupe traité avec le placebo. Cette étude montre que la Spiramycine utilisée comme complément au surfaçage radiculaire résulte en une amélioration statistiquement significative concernant la profondeur des poches au sondage pour une période dépassant 24 semaines lorsque comparé avec un placebo. Des études plus longues et des évaluations microbiologiques sont nécessaires pour déterminer si un effet plus long est possible.

Key Words: Periodontitis, antibiotic, spiramycin, antimicrobial

Introduction

Over the last decade, there has been an increasing acceptance of the specific plaque hypothesis² in explaining the etiology of periodontal diseases in humans. Considerable evidence is now available to show that the microbial flora associated with periodontal diseases differs markedly from that found in association with clinically healthy gingiva.³⁻⁷ While plaque removal is still a fundamental part of periodontal therapy, there have been increasing efforts to chemo-therapeutically alter the nature of the periodontal

microflora from one consistent with disease to one consistent with health.⁸⁻¹¹ The association of specific organisms with various periodontal diseases has led to the successful use of antimicrobials in the clinical management of these disease entities. Tetracycline has been shown to be a useful adjunct in the treatment of juvenile periodontitis by its suppression of actinobacillus actinomycetemcomitans.¹¹ Metronidazole is effective against gram-negative anaerobes and spirochetes, and has been used in the treatment of advanced periodontitis¹² and ulcerative gingivitis.¹³

Spiramycin is a macrolide that has demonstrated a bactericidal effect against a broad spectrum of gram-positive organisms as well as hemophilus influenza, bordetella pertussis, neisseria, bacteroides sp., caprocytophaga, and some fusobacteria. Spiramycin has been shown to concentrate in bone,¹⁴ gingival tissue and salivary glands¹⁵ for long periods of time, and to gradually diffuse from these sites.

Although it has been used in the treatment of periodontal diseases since 1956,¹⁶ until recently there have been no well-controlled, longitudinal clinical studies of the effect of Spiramycin in treating periodontal diseases. The several reports that have been published¹⁷⁻²⁰ are either anecdotal, of very short duration, or contain methodological flaws that dilute the significance of their findings. It was only recently, in a well-controlled study,¹ that Spiramycin was compared to tetracycline as an adjunct to conventional therapy in the management of advanced periodontitis, and was shown to suppress spirochete levels for a full six months with less rebound effect than has been seen with tetracycline.

The purpose of this study was to compare the effects of Spiramycin and a placebo as adjuncts to scaling and root planing in the treatment of advanced chronic periodontitis in humans.

Methods and Materials

The study included 193 patients with advanced periodontitis, and was performed as a multi-centred,

controlled, double-blind, parallel randomized trial, with a drug factor at two levels (Spiramycin and placebo), and a centre factor at seven levels (the faculties of dentistry at Dalhousie University and the universities of British Columbia, Manitoba, Laval, Alberta, Saskatchewan and Toronto). The investigation was approved by the local ethics committee in each centre.

In order to take part in the study, patients had to meet selection criteria previously set out.¹ These criteria were as follows:

1. At least 35 years of age.
2. Clinical and radiographic evidence of periodontal disease.
3. At least two sites in interproximal areas with a probing depth of 7.0 mm or more and a contacting adjacent tooth.
4. Presence of at least 15 teeth.
5. Absence of all other serious or complicating oral pathology.
6. No periodontal therapy for at least six months.
7. No antibiotics for at least six months.
8. No specific contra-indications to participation (including hypersensitivity to the medication).
9. No pregnancy or breast feeding. All women of child bearing potential in the study had to be following a recognized contraceptive program.
10. Willingness to give informed consent.

Site Selection

Each patient underwent a complete periodontal examination. Two sites were selected in each mouth. These were the two deepest interproximal probing depths where a contacting adjacent tooth was present. Where sites of identical depth were present, the more distal site was selected.

Study Medication

Each patient was treated for a period of 14 days with either Spiramycin "500" capsules, each containing 1,500,000 IU of Spiramycin, bid, or with a visually-identical



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Indications: For the treatment of infections of the respiratory tract, buccal cavity, skin and soft tissues due to susceptible organisms.

Pharmacology: It is active against the following gram-positive organisms: *S. aureus* (including penicillin resistant strains), beta-hemolytic streptococci, *S. viridans*, *S. faecalis* and *S. pneumoniae*, *C. diphtheriae*, clostridia.

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placebo capsule, also bid. Drug material was provided by Rhone Poulenc Pharma Inc., of Montreal in identical labelled bottles containing 28 capsules each. Each operator had sealed envelopes containing information to break the code in the event of significant side effects. Patients were provided with an emergency phone number, advised to report any adverse reactions, and asked to bring the drug bottle with them at the two-week visit (for a count of any unused capsules). In addition, they were advised to contact the investigator in the event another antibiotic was prescribed to them elsewhere, since this would exclude them from the study.

Parameters Measured

1. Medical Status, Physical Examination and Blood Chemistry

In accordance with Health Canada guidelines, each patient completed a comprehensive medical history at baseline. When the administration of medication was complete (2 weeks), each patient underwent a brief physical examination consisting of weight, blood pressure and pulse rate. Each patient was also referred at baseline and at two weeks for a complete blood count, differential and full blood biochemistry evaluation.

2. Clinical and Microbiological Parameters

The following parameters were measured in the order outlined at each study site and interval:

- i. Plaque Index (PI) was determined using the criteria of Silness and Löe.²¹
- ii. Gingival Crevicular Fluid (GCF) measurements were made using a Periotron Model 6000 (Harco, Medical Electronic Devices, Inc.), after collection based on the method of Löe and Holm Pedersen.²²
- iii. After removal of supragingival plaque by a curette, subgingival plaque samples were collected at each site by sequentially inserting three pa-

per points. These results will be reported in a future paper.²³

- iv. Probing depths (PD) were measured from a notched reference point on an acrylic occlusal stent and were recorded to the nearest millimetre.
- v. Attachment level (AL) was also measured from the notched reference point on the stent according to the method of Clark et al.²⁴
- vi. Bleeding on probing was recorded as present or absent at each site.

Study Intervals

After initial screening for the study, and having obtained informed consent, each patient had alginate impressions to allow for fabrication of the stent and was referred for initial blood work. The following procedures were then carried out for each patient at the specific study intervals.

BASILINE: Weight, blood pressure and pulse rate were measured. A clinical and microbiological examination (outlined above) was carried out, and each patient was issued a sequentially numbered bottle randomly assigned as either drug or placebo. They were directed on how to take the medication, and asked to bring back the bottle at the two-week visit for a count of unused medication. Scaling and root planing was initiated, and oral hygiene instruction given as deemed appropriate. An emergency phone number was issued to report any adverse drug reaction. Scaling and root planing of three to five hours duration was completed during the two weeks of drug therapy.

TWO WEEK VISIT: Each patient's blood work was repeated, as were weight, blood pressure and pulse measurements. Unused medication was counted to assess compliance and any adverse reactions were noted. The clinical and microbiological examination was repeated.

WEEKS EIGHT, 12, 24: All clinical and microbiological measurements were repeated.

Statistical Analysis

The demographic and clinical data recorded at baseline were described using the mean and standard error. In spite of a logarithmic transformation, it was not possible to reach homogeneity between centres. This precluded performing the analysis according to a 2 x 7 factorial design, and it was decided to compare the two treatment groups without taking the centre factor into account, using an analysis of variance for parallel groups, provided there was homoscedasticity of the residual variances.

Data recorded during the study were submitted to the same descriptive analysis. Comparisons between drug levels at each time interval were done using analysis of variance and co-variance. Data recorded at baseline were used as a regressor if a significant relationship was observed with those recorded later, and provided there was homogeneity of the slopes.

For each drug level, evolution within time was assessed using an analysis of variance for repeated measurements. All data that did not fit for analysis of variance were tested with the usual nonparametric tests. Type I error was set at five per cent.

Results

Of the 193 patients who started the study, 189 completed it. Two patients (one from each group) terminated due to periodontal symptoms, and two (both Spiramycin patients) terminated due to emergent signs and symptoms — gastrointestinal upset, abdominal pain and diarrhea. This is consistent with the percentage of side effects shown in other studies.²⁵

In all, 96 patients received Spiramycin (Group I), and 97 received placebo (Group II). Mean age was 47.3 ± 1.0 years in Group I and 48.5 ± 1.2 in Group II. There was no statistically significant difference between the groups with respect to age, sex or pre-study medication history.

At baseline and week-two evaluations, no statistically significant differences were found with respect to weight, systolic and diastolic blood pressure, pulse rate or reported abnormal findings. These abnormal findings included nervousness, tiredness and drowsiness in the placebo group and euphoria in the Spiramycin group.

A very few of the blood laboratory results showed any statistically significant differences, and none of these differences were considered to have clinical significance.

Clinical Results

The results of all clinical parameters are listed in **Tables I to IV**. The data presented represent a total of 386 separate sites in 193 patients at baseline, reducing to 378 sites in 189 patients at 24 weeks.

i. Plaque Index (**Table I**)

As would be expected, plaque index reduced from baseline in both groups. However, there was no statistically significant difference between Groups I and II at any of the time intervals.

ii. Gingival Crevicular Fluid (**Table II**)

While the GCF measurements were consistently lower in the drug group, this was only sufficient to show statistical significance at the two-week interval ($p = 0.0008$).

iii. Probing Depth (**Table III**)

In the case of PD, a statistically significant difference favoring the drug group was seen at every time interval throughout the study, except at baseline. At two weeks $p = 0.0125$; at eight weeks $p = 0.0020$; at 12 weeks $p = 0.0032$; and at 24 weeks $p = 0.0075$.

Over the course of the study, probing depth was reduced in the Spiramycin group from 7.60 $\pm$ 0.08 mm to 4.73 $\pm$ 0.11 mm, and in the placebo group from 7.53 $\pm$ 0.08 mm to 5.13 $\pm$ 0.14 mm.

iv. Attachment Level (**Table IV**)

Again, while AL measurements were consistently slightly lower in

Table I
Plaque Index

	Placebo	Spiramycin	F	P
Baseline	1.36 $\pm$ 0.08	1.26 $\pm$ 0.08	0.70	NS
Week 2	0.87 $\pm$ 0.07	0.69 $\pm$ 0.07	2.20	NS
Week 8	0.93 $\pm$ 0.08	0.85 $\pm$ 0.07	0.11	NS
Week 12	0.86 $\pm$ 0.07	0.87 $\pm$ 0.08	0.27	NS
Week 24	0.90 $\pm$ 0.08	0.94 $\pm$ 0.07	1.01	NS
Analysis of Variance - Parallel Groups				

Table II
Crevicular Fluid

	Placebo	Spiramycin	F	P
Baseline	91.21 $\pm$ 4.80	80.17 $\pm$ 4.42	2.86	NS
Week 2	73.76 $\pm$ 4.76	58.61 $\pm$ 3.46	7.28	0.0076
Week 8	74.98 $\pm$ 4.25	57.48 $\pm$ 4.30	0.49	NS
Week 12	62.23 $\pm$ 4.43	55.50 $\pm$ 3.53	0.63	NS
Week 24	62.83 $\pm$ 4.17	61.03 $\pm$ 4.27	0.12	NS
Analysis of Variance - Parallel Groups				

the drug group, this was only statistically significant at the 12-week interval ($p = 0.0146$).

Discussion

The results of this study confirm those of Listgarten et al⁹ and Chin Quee et al,¹ who found that scaling and root planing, with or without supplementary antibiotic therapy, will significantly reduce all measured clinical parameters of disease toward a level of periodontal health. With respect to both probing depth and attachment level measurements, this downward trend was sustained for the full six months of the study. Our microbiological results, to be reported in a future paper,²³ also confirm Chin Quee et al's¹ findings of a suppressed spirochete level up to the six months level. In his study, Chin Quee¹ showed that the rebound effect of spirochetes, originally described by Listgarten et al⁹ using tetracycline, was less marked for Spiramycin when the two drugs were directly compared.

This study shows a sustained, statistically significant reduction in probing depth in the Spiramycin group compared to the placebo.

While one might question the clinical significance of an extra 0.5 mm reduction in probing depth, it is our feeling, in agreement with that expressed by Listgarten et al,⁹ that by pooling data, particularly with such a large sample size, one tends to obscure clear-cut clinical changes in individual sites. Particularly in the light of the ongoing hypothesis of "bursts" of disease activity followed by periods of quiescence,²⁶ it may well be that more significant clinical improvements were achieved in "active" sites than in "inactive" ones. Equally, the selection of only the two deepest sites does not ensure that the most active sites are being monitored. Socransky et al²⁶ have shown that existing probing depth cannot be used as a predictor of future disease activity.

By excluding patients below the age of 35, we have a much older mean age group than the patients in Listgarten's study (48 years vs. 34 years). Since his selection criteria required at least 50 per cent average bone loss at the study sites, it may well be that he was dealing with a group of patients with other, more active forms of periodontal



disease than those found in our older patient group. If this is the case, then the sustained reduction in PD up to six months is all the more significant since Listgarten's patients showed no significant difference in PD between the "scaling and placebo" and "scaling and tetracycline" groups after the eight-week interval.

The results of this study differ from those of Chin Quee et al,¹ who showed no statistically significant differences between Spiramycin and placebo in any of the clinical parameters measured. Their selection criteria and the mean age of patients were virtually identical to those used in the present study. Differences between the results may be due to their smaller sample size (28 as compared to 96 patients in the Spiramycin group), or to the operator variability inevitable in a multi-centred study. Their study involved one operator performing the scaling and root planing over a period of six hours, while the present study involved seven operators in different centres, performing scaling and root planing over a period of three to five hours. It is our feeling that the multi-centred approach, while introducing operator variability, is, in fact, a more valid simulation of clinical practice, with its many variables.

The dosage of Spiramycin used in the study was selected by consensus of the investigators and is largely empirical. Investigation of alternate dosages is justified, as is research in the area of local drug delivery employing the techniques already described for tetracycline.^{27,28} This approach has been shown to deliver a much higher concentration of the antibiotic to the site of disease activity, while systemic serum levels are dramatically reduced, with an obvious benefit in the reduction of systemic side effects.

The primary objective in periodontal therapy is the long-term survival of the dentition. This has traditionally been achieved, with some considerable success, by a combination of scaling, root planing, surgical therapy aimed at pocket reduction and/or gain of new attachment, and long-term

Table III

Probing Depth

	Placebo mm	Spiramycin mm	F	P
Baseline	7.53 ± 0.08	7.60 ± 0.08	0.32	NS
Week 2	6.07 ± 0.12	5.76 ± 0.12	6.34	0.0125
Week 8	5.49 ± 0.13	5.06 ± 0.12	9.90	0.0020
Week 12	5.34 ± 0.13	4.91 ± 0.12	9.90	0.0032
Week 24	5.13 ± 0.14	4.73 ± 0.11	7.31	0.0075
Analysis of Variance - Parallel Groups				

Table IV

Attachment Level

	Placebo mm	Spiramycin mm	F	P
Baseline	10.69 ± 0.16	10.72 ± 0.15	0.03	NS
Week 2	9.92 ± 0.17	9.74 ± 0.16	2.27	NS
Week 8	9.42 ± 0.16	9.13 ± 0.18	1.45	NS
Week 12	9.30 ± 0.19	8.87 ± 0.20	6.08	0.0145
Week 24	9.11 ± 0.19	8.85 ± 0.16	3.19	NS
Analysis of Variance - Parallel Groups				

professional maintenance, usually with three-month intervals between appointments. Although this approach has stood the test of time, it can be both time consuming and expensive. It would be of considerable benefit, in the management of the periodontal patient, if the need for surgical therapy and/or frequent professional maintenance could be reduced without compromising the overall periodontal status. This study has shown both sustained reduction in pocket depth and maintenance of attachment level over a six-month period. While much too short a time to determine any long-term benefits in therapy, it shows sufficient promise to warrant future research over longer periods to establish whether longer-term gains can be achieved.

The longer-term reduction in subgingival spirochete levels when using Spiramycin may be due to the presence of higher levels of Spiramycin in gingival sulcular fluid well after systemic administration is completed. Further investigation is necessary to establish the total

time for which therapeutic levels of the antibiotic are present in the sulcus after cessation of systemic administration.

It should be stressed that the largest part of the reduction in pocket depth was achieved by several hours of scaling and root planing. Spiramycin and other antibiotics can only be considered as a potential adjunct, and not as a replacement for thorough scaling and root planing.

Acknowledgements: This study was supported by a grant from Rhone Poulenc Pharma Inc., Montreal, Canada. The authors wish to thank Dr. Trevor Chin Quee for his assistance in developing the study protocol and his ongoing interest.

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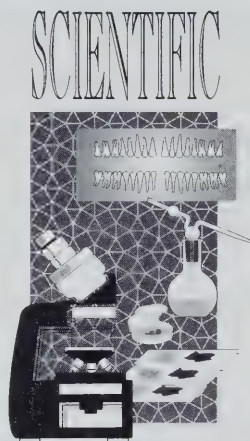
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Tobacco Counselling Among Alberta Dentists

H. Sharon Campbell, PhD

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ABSTRACT

Evidence suggests that dentists, with their existing commitment to prevention and their opportunity for regular interaction with patients, have the potential to significantly decrease tobacco-related morbidity and mortality. In 1992, dentists belonging to the Alberta Dental Association were surveyed to determine their attitudes, behavior and perceived obstacles to tobacco counselling. The 755 respondents represent 55 per cent of the province's practising dentists. Their attitudes toward involvement in tobacco counselling varied. Over 90 per cent agreed that dentists should show leadership and set a good example. However, only 60-70 per cent indicated that they should try to convince or actively help patients quit, and 25 per cent indicated that intervention was not appropriate. Little difference was found in the preferred counselling approach, with most dentists limiting their counselling efforts to discussing the hazards of smoking and benefits of quitting. Very few provided patients with specific strategies to change their smoking behavior. Perceived obstacles to tobacco counselling included a lack of coordination and exchange of information between dentistry and cessation services, pessimism about the patients' ability to change their tobacco habit, the need for further training, and

the fact that counselling was not a high priority. This survey suggests that dentists could expand their role as tobacco counsellors. Professional associations and educational institutions have the potential to greatly assist the dental community in this regard, and attention should be given to the development and dissemination of informational campaigns and educational workshops.

SOMMAIRE

Tout semble démontrer que les dentistes, parce qu'ils préconisent la prévention et ont l'occasion de communiquer régulièrement avec leurs patients, peuvent réduire de beaucoup les cas de morbidité et de mortalité dus au tabagisme. En 1992, on a interrogé 755 dentistes de l'Association dentaire de l'Alberta (soit 55 p. cent des praticiens dentaires de la province) pour connaître leurs attitudes, leur comportement et les obstacles qu'ils entrevoient touchant la lutte antitabac. A ce sujet, les attitudes varient. Ainsi, plus de 90 p. cent sont d'avis que les dentistes doivent faire preuve de leadership et donner le bon exemple, alors que seulement 60 à 70 p. cent croient qu'ils devraient essayer de convaincre leurs patients de cesser de fumer ou de les y aider concrètement, un effort que 25 p. cent jugent inopportun de leur part. Par contre, dans la manière d'offrir des

conseils, on a relevé peu de différences, la plupart des dentistes se bornant à parler des dangers du tabagisme et des avantages à cesser de fumer. Très peu proposent à leurs patients fumeurs des stratégies pour changer leurs habitudes. Enfin, parmi les obstacles entrevus, les répondants ont mentionné entre autres le manque de coordination et d'échanges d'informations entre la profession dentaire et les services antitabac, le pessimisme touchant l'aptitude des patients fumeurs à vouloir changer leurs habitudes, le besoin d'une formation plus poussée et le fait que donner des conseils à ce sujet n'est pas d'une grande importance. Bref, cette étude suggère que les dentistes pourraient jouer un rôle plus grand en tant que conseillers dans la lutte contre le tabagisme. Les associations provinciales et les maisons d'enseignement peuvent, à cet égard, apporter une aide considérable à la communauté dentaire, et il conviendrait de songer à lancer des campagnes d'information et à offrir des ateliers pour parfaire la formation des dentistes dans ce domaine.

Introduction

One quarter of all deaths among Canadians over age 35 are attributable to tobacco.¹ In fact, tobacco is the major cause of 30 per cent of cardiovascular disease and cancer deaths and, as such, remains the number-one health problem across Canada. Although smoking rates are dropping slowly in certain age-sex cohorts, 29 per cent of Canadians continue to smoke, with a higher prevalence among males, those between 20 to 44 years of age, and those with limited education or living in rural areas.²⁻⁴ Although less prevalent than cigarette use, smokeless tobacco also presents a serious problem.^{5,6}

Studies have shown that health professionals can be effective at counselling patients to stop using tobacco. A strong message, delivered as part of routine care and offering appropriate assistance, can lead to cessation rates of 15 to 20 per cent.⁷⁻¹² While the majority of studies have involved physicians, several recent studies have shown that similar figures can be achieved by dental professionals.^{8,13} The dental team is well situated in the health care system to provide tobacco counselling. Preventive treatment services, oral screening and patient education are already an integral part of dental practice. Over 60 per cent of adults and 83 per cent of 15 to 19 year olds see their dentist one or more times a year.⁴ A recent survey of smokers found that 71 per cent of those aged 50 and over had visited their dentist in the last year and that, overall, 59 per cent of smokers make regular preventive dental visits.¹⁴ Regular interactions with patients represent repeated opportunities for the dentist to engage in tobacco counselling. Studies have shown that interventions to reduce tobacco use are more effective when they involve serial rather than single contacts.¹⁵ Further, tobacco use impacts directly on the care provided by the dental team. The adverse oral effects of tobacco use include leucoplakia, stomatitis, gingival bleeding, periodontitis, gingival recession, acute necrotizing ulcerative gingivitis,

increased dental calculus formation, halitosis, and dental staining.¹⁶

Dentists have varying attitudes toward tobacco counselling. However, most studies show there is majority agreement that dentists should set a good example by not smoking themselves, actively speak out against smoking, and help patients who wish to quit.¹⁷⁻²⁰ One study found that although less than one quarter of the dentists surveyed believed "counselling about smoking is not all that important," almost 100 per cent believed smokers are not that interested in quitting.²¹ Additionally, studies indicate that not all dentists are comfortable with the idea of counselling their patients or feel that their counselling is effective.^{19,21}

The types of counselling activities used by dentists vary from minimal interventions such as a no-smoking policy in the waiting room to more intensive activities. A number of studies have shown that between 65-87 per cent of dentists provide some type of advice about cutting down or quitting, about 35 per cent provide self-help materials or refer patients to other services, 40-84 per cent record tobacco status in the chart and 22-60 per cent follow-up patients who indicated they want to quit.¹⁸ The COMMIT trial found 51 per cent of dentists ask new patients about smoking and 29 per cent ask return patients.²² Few set cessation dates (0.6 per cent), develop cessation plans (2.0 per cent), provide self-help materials (4.8 per cent) or prescribe nicotine gum (5.3 per cent).²² A recent policy statement by the Canadian Dental Association highlighted the importance of the tobacco issue for the dental profession.²³ In light of this, we undertook a provincial survey of dentists in Alberta to determine their tobacco-related attitudes, behaviors and perceived obstacles to counselling.

Methods

Sample: All dentists belonging to the Alberta Dental Association in 1991 (n = 1,384) were included in the survey, with the exception of

the sub-sample of 192 dentists used to pretest the questionnaire.

Questionnaire: A self-administered questionnaire was used to collect data from dentists on the following variables: dentists' attitudes about their role in tobacco cessation (11 items measured on five-point Likert scales); office procedures (i.e., was smoking permitted in reception areas, were routine smoking histories taken, was routine oral cancer screening done, was tobacco use and/or counselling charted?); perceived obstacles to active treatment of tobacco use; demographic characteristics (i.e., age, gender, years in practice, dental program graduated from, practice location); current and past tobacco use; and practice characteristics (general dentist vs. specialist, solo vs. group practice, total number of patients in practice, number of patients seen per day, number and type of dental hygienists and assistants). Dentists were presented with a list of general counselling strategies and asked to indicate which ones they used. Where possible, questions were taken from previous dental surveys.^{17,18,24} The questionnaire was pretested on a random sample of 15 per cent of Alberta dentists (n = 192) and minor changes were made. Although the numbers were small, test-retest measures on a subset of the pretest sample (n = 46) showed a consistency in responses over time.

Data Collection: The revised questionnaire was mailed to each dentist with a self-addressed, stamped return envelope. Non-respondents were sent one reminder letter, after which a random sample of the remaining non-respondents was contacted by telephone. Data collected from these non-respondents included age, years in practice, current and past tobacco use, attitudes toward counselling and current tobacco counselling practices.

Analyses: Completed questionnaires were coded and entered into a database using Epi Info Version 5.²⁵ Frequencies were used to examine the distribution of responses for all variables and describe sample demographics. There were too

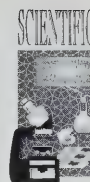


Table 1

Attitudes About Dental Role In Tobacco Counselling

Attitude	% Agree	% Neutral	% Disagree
Dentists should show health care leadership by maintaining a smoke-free workplace (n = 745).	94.4	3.5	2.2
Dentists should set a good example by not using tobacco products (n = 745).	93.0	4.1	3.0
Dentists should be more active than they have been in speaking to the public about the health risk of tobacco use (n = 744).	71.1	18.9	10.1
Hygienists should participate in community presentations discouraging tobacco use (n = 741).	62.1	26.2	11.8
Dentists should try and convince their patients to stop using tobacco products (n=742).	72.8	12.9	14.3
Dentists should actively help patients who wish to stop using tobacco products (n = 743).	62.5	19.9	17.5
Dentists and/or auxiliaries should be willing to make repeated counselling attempts, even if their patients continue to use tobacco products (n=743).	49.1	17.9	33.6
It is the auxiliaries' responsibility to counsel smokers and smokeless tobacco users (n = 740).	27.2	23.4	49.6
Intervention is not appropriate since tobacco use is a matter of personal choice (n=735).	24.6	17.9	57.5

few smokers or females in the sample to allow for examination of these sub-groups. Practice location was collapsed into urban (Calgary and Edmonton dental districts) and rural (northern, central and southern dental districts), years in practice was collapsed at the median into recent (<15 years) and older graduates (≥15 years), and the scales measuring attitudes were collapsed into trichotomous variables (agree/neutral/disagree; comfortable/neutral/not comfortable; useful/neutral/not useful). Cross tabulations and chi-square tests were used to assess differences for: 1) respondents vs. non-respondents; 2) urban vs. rural practices; and 3) recent vs. older graduates.

Results

Subjects

Seven hundred and sixty-five dentists (64 per cent) returned questionnaires. No difference in response was seen by urban/rural status. Of the 765 dentists returning questionnaires, four were not practising in Alberta, five had retired and one was in a solely administrative position. These dentists were excluded from subsequent analyses. The results reported below are for the remaining 755 dentists, who represent 55 per cent of dentists practising in Alberta.

The majority of respondents were male (86 per cent) and the median age was 39 years (range

22-75 years). Seventy-eight per cent had practices in the two largest urban areas in Alberta (Edmonton and Calgary) and 71 per cent had graduated from the University of Alberta's faculty of dentistry. The median length of practice was 13 years (range 1-51 years), with urban dentists working for an average of 1.7 years longer than rural dentists. Most were general dentists (87 per cent), with approximately equal proportions in solo and group practices (51 per cent and 44 per cent, respectively). The majority had practices of 2,000 or more patients and saw 21 to 30 patients per day. Although 32 per cent of respondents had previously used tobacco, only four per cent reported current use. No difference in smoking behavior was seen by urban/rural status. Recent graduates were less likely than older graduates to have ever used tobacco (25 per cent vs. 40 per cent, $p < 0.001$) or to currently use it (two per cent vs. seven per cent, $p = 0.004$).

Only 23 of the sub-sample of 75 randomly selected non-respondents (31 per cent) could be contacted and/or were willing to complete the telephone interview. Non-respondents differed from respondents in only their past and current tobacco use. A larger proportion of non-respondents than respondents had ever used tobacco (52 per cent vs. 32 per cent, $p = 0.04$) or currently used it (26 per cent vs. 4.0 per cent, $p < 0.001$).

Attitudes

Table 1 summarizes the respondents' attitudes regarding their role in tobacco counselling. Over 90 per cent agreed that dentists should show leadership by maintaining a smoke-free workplace and set a good example by not using tobacco. Fewer indicated that dentists should "try and convince" patients (73 per cent) or "actively help" them (63 per cent) to quit, or that dentists should make repeated counselling attempts (49 per cent). Only 29 per cent agreed that counselling was the auxiliaries' responsibility and only 17 per cent felt that it was solely a medical responsibility. However, 25 per cent indicated that intervention was not appropriate as tobacco use is a matter of personal choice.

Dentists were also asked about the usefulness of counselling and their comfort level with counselling patients. Only 36 per cent indicated that counselling patients was useful, and even fewer (28 per cent) indicated they were comfortable with counselling. No urban/rural differences were found, but recent graduates were less comfortable than older graduates (42 per cent vs. 56 per cent, $p < 0.001$). Sixty-four per cent of respondents indicated they were willing to attend a training program and 75 per cent were also willing to send other staff. Urban dentists were less willing to attend than ru-

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Table II

Obstacles To Tobacco Counselling

Obstacle	% Total sample agreeing (n = 755)	% Recent graduates agreeing (n = 415)	% Older graduates agreeing (n = 340)	X ²
There is a lack of coordination and information between dentistry and tobacco cessation services	44.4	49.0	39.5	6.93 ^b
I am pessimistic about people's ability to change their tobacco use habit	43.3	44.1	42.5	0.21
I need further training in order to treat tobacco use effectively	36.4	42.1	30.4	11.03 ^a
Counselling patients about tobacco use is not a high priority for me	30.7	26.2	35.6	7.93 ^a
I fear patients "tuning out" to other relevant oral health advice	21.6	23.3	19.7	1.45
It is the medical rather than dental professions' responsibility to treat tobacco use	17.5	16.9	18.1	0.18
Patients resist referral to cessation clinics or self-help programs	17.1	17.7	16.4	0.21
I have little confidence that available services can effectively treat tobacco use	14.6	12.1	17.3	4.11 ^b
There are too few services to which patients can be referred	14.2	15.6	12.6	1.43
I fear that tobacco users will leave my practice if counselled to give up their habit	13.4	17.4	9.0	11.47 ^a
I am too busy to be concerned with tobacco treatment counselling	11.5	10.8	12.3	0.45

^ap ≤ 0.005
^bp ≤ 0.05

ral dentists (62 per cent vs. 74 per cent, p = 0.006).

Tobacco Counselling Activities

Fig. 1 displays tobacco counselling activities used by the respondents. Little variation was seen in counselling approach, with 65 per cent or more discussing the hazards of smoking or benefits of quitting with their patients. In terms of providing specific advice, the respondents were most likely to advise patients to cut down their tobacco use rather than quit "cold turkey." Fewer than 15 per cent refer patients to smoking cessation classes, offer information pamphlets, or prescribe nicotine gum. Little difference was seen by urban/rural status. Recent graduates were more likely than older graduates to advise patients to cut down their tobacco use (45 per cent vs. 35 per cent, p = 0.003).

Table II shows obstacles to counselling identified by the respondents. The four most frequently identified obstacles were lack of coordination between dentistry and tobacco cessation serv-

ices, pessimism about the patients' ability to quit, a need for further training, and a belief that counselling is not a high priority. Interestingly, while recent graduates were less likely than older graduates to indicate that counselling was not a high priority and that they had little confidence in available services, they were more likely to indicate a lack of coordination between dentistry and tobacco cessation services, as well as a fear of patients leaving their practice. Obstacles to counselling were also examined by practice location. Urban respondents were less likely than rural dentists to indicate pessimism about the patients' ability to quit (41 per cent vs. 52 per cent, p = 0.02) or lack of referral services (12 per cent vs. 21 per cent, p = 0.006).

When office policies/procedures that might affect counselling activities were examined, nearly all respondents (98 per cent) reported non-smoking reception areas. Although 41 per cent reported that some of their staff smoked, fewer than 13 per cent of these dentists allowed employees to smoke in the workplace. Overall,

51 per cent indicated that patient tobacco use is recorded in the chart. However, only 39 per cent routinely take an in depth smoking history, and even fewer (12 per cent) consistently record patient counselling in the patient's chart. **Fig. 2** shows differences in these variables by urban/rural status and years in practice. Urban dentists and recent graduates were more likely to both record patients' tobacco use in the chart and take a routine smoking history.

Discussion

Dentists have shown that they can be effective in counselling patients to reduce their tobacco use.^{8,13} A knowledge of dental attitudes, current practises and perceived obstacles to tobacco counselling will help in the planning of appropriate strategies and programs to foster and support this activity. The overall response rate of 64 per cent indicates an interest in this topic within the Alberta dental community.

Two study limitations should be noted. Results represent only 55 per cent of the dentists practising in



the province, and comparisons with non-respondents suggest this sample under represents tobacco users. Current tobacco use among this sample was very similar to recent American studies^{17,20,21} and to results from the COMMIT trial in which Canadian dentists participated.²² However, as noted by others, survey respondents may not reflect the general dental population and tobacco counselling activities may, in fact, be even lower than are reported here. A second limitation occurs with self-reported data. While an effort was made to reduce the occurrence of socially desirable responses, by assuring dentists that their responses would be confidential, this limitation must be acknowledged. However, our results are similar to others, which suggests some validity.

Despite the low prevalence of tobacco use among this sample, it is alarming that 41 per cent of the dentists report staff who smoke. Although the majority of these are not allowed to smoke at work, the odor of tobacco will still permeate their clothing, hair and breath. If the dental team is to successfully set an example for its smoking patients, then all team members need to be smoke free. Smoking cessation among dental workers should be an initial priority and future surveys should gather smoking histories from all staff to ascertain the prevalence of smoking among dental support workers.

The dentists in our sample were in strong agreement with assuming a leadership role in tobacco cessation efforts, particularly in maintaining smoke-free workplaces and not using tobacco themselves. Most also agreed that dental professionals could play a more public role in speaking out about tobacco use and should encourage and assist patients to quit. Very few felt tobacco counselling was not an appropriate role for dentists, which is consistent with the views of American dentists.¹⁷⁻¹⁹ However, dentists in our sample were less likely than their American counterparts to question the patients' ability to quit. Forty-three per cent of this sample were pessimistic compared to the 64 per cent found by Sever-

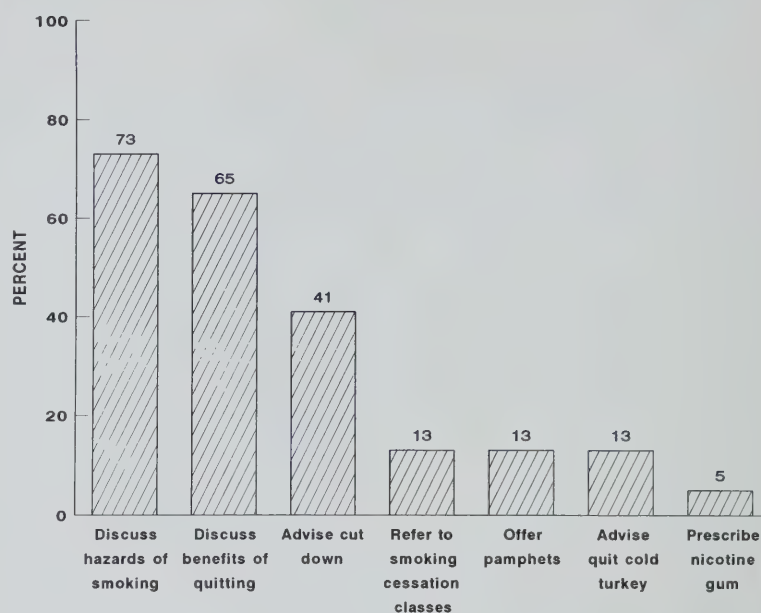


Fig. 1: Tobacco counselling activities by respondents.

son et al²⁴ and the nearly 100 per cent found by Gerbert et al.²¹ Few were optimistic that their counselling efforts would get smokers to quit. This is not an unfounded belief, given that even the most effective professional counselling interventions achieve about a 15-20 per cent cessation rate.²⁷ Few respondents (28 per cent) felt comfortable counselling patients, and one third indicated a need for further training. Interestingly, recent graduates were less comfortable with counselling than dentists with more experience, and a greater proportion felt they needed further training. Little difference in the type of counselling activities used was found by years in practice, and the difference in comfort levels may simply reflect differences in the length of the respondents' experience in dealing with patients. However, given that recent graduates were also less likely than older graduates to have ever used tobacco, the difference may also reflect feelings of inadequacy, as counsellors, due to never having been a smoker. Like others, we found the most common approaches to tobacco counselling were to discuss the hazards of smoking and the benefits of quitting, and to advise patients to cut down.^{19-21,24} These strategies are

consistent with dental attitudes of trying to convince patients to stop using tobacco products. However, studies have shown that professionals' counselling is more effective if patients are provided with concrete assistance such as referrals to cessation classes, self-help materials, or nicotine gum prescriptions.^{15,26,27} Fewer than 15 per cent of our sample used any of these specific strategies, compared with less than six per cent of dentists who participated in the COMMIT trial²² and 35 per cent of American dentists taking part in other studies.^{20,21} One might expect the low rate of referrals or provision of self-help materials in this sample to be the result of a perception that existing counselling services are not effective or that patients would resist referral. However, we found that the majority of respondents did not hold these views. Involvement of the dental profession in tobacco counselling is relatively new, particularly in Canada. Thus our results may reflect a lack of knowledge about different counselling strategies and service availability, or a perceived deficiency of counselling skills. Indeed, 44 per cent of our respondents felt there was a lack of coordination between den-

tistry and tobacco cessation services.

Routine smoking histories, recording tobacco use and tobacco counselling have been identified in the literature as cues to action that increase the likelihood that health professionals will perform counselling activities.^{7,8,11,25,26} Like other researchers, we found that relatively few dentists currently use these techniques, although a greater proportion of recent graduates and urban dentists do so.^{20,21} Incorporation of these types of reminders into daily office routines would substantially increase the likelihood that dentists would provide tobacco counselling.

Conclusion

Our results concur with studies of American dental professionals showing increasing support for a dental role in tobacco counselling.^{17,21} Encouragingly, few dentists were too busy to counsel, or were concerned that tobacco users would leave their practice. Most of the cited obstacles to counselling could be addressed through informational campaigns to change attitudes, educational programs to improve dental counselling skills, and simple changes to office routines. If strategies to increase tobacco counselling among dentists are to be successful, greater awareness is needed of the important role dental professionals can play and the resultant public health benefits of such involvement. A 20 per cent cessation rate is not encouraging for the individual practitioner, but the impact on public health if that rate were achieved by all dentists would be substantial. The development of a mechanism for measuring and communicating province-wide cessation rates would allow dentists to see the impact of their collective actions and might serve to reinforce counselling practices.

Professional associations and educational institutions need to increase their involvement in the smoking-cessation area. Existing policy statements on tobacco use and health should be updated to encourage dentists to become more actively involved in tobacco counselling. These bodies also

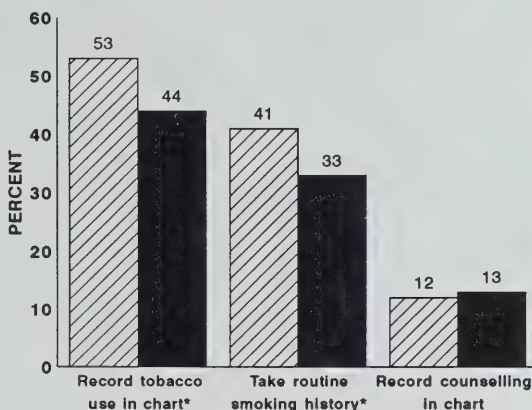
have the potential to influence counselling activities by becoming actively involved in the development and dissemination of informational campaigns and educational programs. Certainly, if the interest in further training that was expressed by dentists in the current study is anything to go by, the time for such involvement is now.

There is growing public awareness of the hazards of smoking, as well as a greater knowledge of both the adverse oral effects associated with tobacco use and the recent

tobacco policy statements made by dental professional associations. Given this increasing support, the dental community's professional associations and educational institutions are in an ideal position to increase and maintain the dental professionals' awareness of their potential role in tobacco counselling, advocate increased dental involvement in tobacco counselling, and promote the development and dissemination of effective strategies to assist dentists in this endeavor.

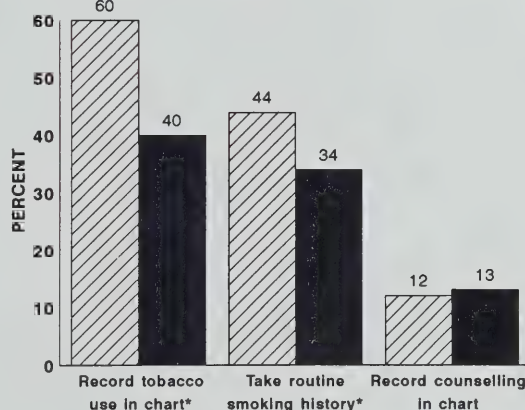
LOCATION

□ Urban dentists ■ Rural dentists



EXPERIENCE

□ Recent graduates ■ Older graduates



* differences are significant $p \leq 0.05$

Fig. 2: Differences by urban/rural status and years in practice.





Dr. Campbell is the acting director of the Cancer Prevention Program, Alberta Cancer Board, Calgary.

J. Macdonald participated in the study as a research associate.

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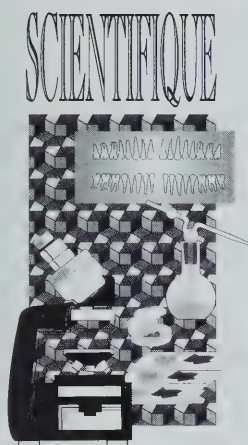
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JOURNAL

March/
Mars
Vol. 60
No. 3



Le laser en médecine dentaire et en chirurgie buccale et maxillo-faciale

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SOMMAIRE

Le laser est apparu dans le monde de la médecine dentaire depuis quelques années. Il existe cependant différents appareils et différents usages indiqués dans presque toutes les disciplines de la médecine dentaire. Cet article se veut une revue de la littérature qui met un accent plus prononcé sur les applications du laser en chirurgie buccale et maxillo-faciale.

Mots clés : laser, laser en médecine dentaire, laser en chirurgie buccale et maxillo-faciale.

ABSTRACT

During the last few years, lasers have begun to appear in dentistry. There are, however, different types of lasers and different therapeutic indications in almost every field of dentistry. This is a review of the current literature on the applications of lasers in oral and maxillo-facial surgery.

Key words: laser, laser in dentistry, laser in oral and maxillofacial surgery.

La médecine d'aujourd'hui est en constante évolution, surtout au point de vue de la thérapie en chirurgie générale. L'introduction et le développement du laser dans ce domaine ont apporté une forte contribution à l'amélioration de la médecine curative. Les recherches pour développer le laser dans les sciences de la santé étant dispendieuses, les études impliquant la chirurgie au laser en dentisterie ont utilisé des systèmes qui ont été, à l'origine, destinés à des domaines médicaux beaucoup plus larges, notamment la chirurgie générale, l'ophtalmologie et la cardiologie.

En premier lieu, il est pertinent de comprendre le mécanisme de fonctionnement d'un système laser afin d'en posséder des notions adéquates de même que la terminologie appropriée. Dans les applications médicales, le laser est fondamentalement une façon versatile de délivrer de l'énergie à des locations précises dans les tissus humains. L'énergie impliquée est essentiellement celle du spectre électromagnétique se situant dans les longueurs d'onde des rayons ultraviolets, de la lumière visible et jusqu'à celles des rayons infrarouges.

Ce spectre d'énergie est formé de photons qui peuvent être individuellement associés avec un quantum d'énergie. Les atomes et

les molécules possèdent un niveau d'énergie (intrinsèque à leur structure) qui peut être stimulé par des procédés tels l'absorption de photons d'énergie suffisante ou collisions avec des ions ou électrons dans une décharge de gaz. Il est essentiel dans les deux cas, qu'un nombre suffisant d'atomes ou de molécules soit élevé aux niveaux d'énergie supérieurs. L'énergie formant le laser est libérée de ces niveaux hautement énergétiques par deux mécanismes : soit par émission spontanée, soit par émission stimulée où un photon induit un atome ou une molécule excitée à libérer l'énergie emmagasinée.

Cette énergie est produite dans une cavité qui consiste en trois éléments fondamentaux. Premièrement, le véhicule actif (la source énergétique) qui peut être un solide, un liquide ou un gaz. Ce véhicule actif détermine la longueur d'onde spécifique d'énergie à laquelle le système laser fonctionne. La deuxième composante est une source d'énergie incidente utilisée pour stimuler les atomes du véhicule actif. La troisième composante est un résonateur optique qui redirige les photons « incohérents » (de niveau d'énergie ou de propriétés non appropriés) qui s'échappent du véhicule actif, produisant une forme de lumière claire directionnelle, monochromatique, cohérente. Ce troisième



élément consiste en une paire de miroirs concaves placés à chaque extrémité de la cavité du système laser.

Selon Pogrel,¹ le rayon laser détruit les tissus qui absorbent son énergie à la longueur d'onde qui leur est spécifique. Ne pouvant transmettre son énergie qu'à une longueur d'onde donnée, chaque système laser ne peut être utilisé que dans un nombre restreint d'opérations. Ce serait l'équivalent de devoir posséder une télévision différente pour syntoniser chaque canal différent. Des recherches sont en cours dans le développement de systèmes lasers réglables, capables de transmettre l'énergie à plusieurs longueurs d'ondes différentes.

Il existe plusieurs types de laser. Les plus couramment utilisés en médecine dentaire et en chirurgie buccale et maxillo-faciale étant le laser à l'argon, qui transmet à deux fréquences différentes (488 et 515 μm représentant le spectre visible de la lumière vert-bleue) le laser au CO_2 transmettant à 10,6 μm (rayons infra-rouges) et le laser au néodymium-yttrium-aluminium-garnet (Nd-YAG) transmettant à 1,064 μm (rayons infra-rouges).

D'après Clarkson,² il est intéressant de noter que, selon la densité de la puissance et du temps d'interaction du laser, le mode de réaction du tissu varie. Les modes de réaction se résument ainsi :

- 1) La coagulation, qui est le mode approprié pour les opérations sur les tissus mous;
- 2) La vaporisation qui s'observe lorsque plusieurs couches de tissus sont chauffées à de hautes températures et libérées, par exemple, en un atour de fumée lorsque le laser au CO_2 est utilisé;
- 3) La photoablation se produit lorsque l'énergie du laser est utilisée pour enlever de fines couches de matériau de façon sélective, ne causant que relativement peu de dommage à la région voisine immédiate de la zone traitée;
- 4) La photodisruption, où les vibrations extrêmement localisées tendent à générer des valeurs

très élevées de champs électriques instantanés qui provoquent un effondrement électrique à la surface du tissu, ce qui résulte en ionisation, production de plasma et génération d'ondes de choc mécaniques hautement localisées.

De nos jours, le laser trouve son application en médecine dentaire dans presque toutes les disciplines, à savoir la dentisterie opératoire, l'endodontie, la prosthodontie, la parodontie, et la chirurgie. Il a également été clairement démontré que les lasers au CO_2 , Nd-YAG et à l'argon pouvaient être utilisés pour la stérilisation d'instruments dentaires.

Dentisterie opératoire

Ablation de la carie

En dentisterie opératoire, le laser au Nd-YAG permet un traitement très conservateur dans l'ablation de la dentine cariée car sa longueur d'onde n'est pas absorbée par l'émail. Pour l'ablation des régions carieuses incertaines, l'utilisation du laser nécessite parfois la turbine à air pour la complétion du traitement. Chaque pulsation du laser vaporise de 40 à 60 μm de substance dentaire cariée. De plus, le laser est également utilisé pour enlever les débris organiques et inorganiques se situant dans les puits et fissures sans endommager l'émail adjacent. Des études *in vivo* au niveau de la pulpe ont démontré que le laser utilisé selon les règles du protocole ne provoque pas de réactions nocives.

D'après Clarkson,² les longueurs d'onde se situant entre 320 et 500 nm permettent une ablation sélective optimale de la dentine cariée car, à ces longueurs d'onde, quatre fois plus d'énergie est requise pour l'ablation de la dentine saine. Les recherches subséquentes avec un laser au Nd-YAG de troisième harmonique utilisant une longueur d'onde de 355 nm ont confirmé les seuils relatifs d'ablation de lésions carieuses et de dentine saine; les vibrations typiques de rayons laser requises pour l'ablation de lésions carieuses «noires» et «blanches» sont respectivement de 0,15 J/cm² et 0,45 J/cm² tandis que, pour la

dentine saine, plus de 1,0 J/cm² est nécessaire.

Pour ce qui est de l'analgésie, une procédure directement reliée à l'ablation de la carie, les praticiens généraux et surtout les pédodontistes ont rapporté un haut taux de succès dans l'utilisation du laser. L'effet peut durer de dix minutes à plus d'une heure. Le succès de cette technique est moins considérable lorsque cette dernière est utilisée sur des personnes plus âgées et décroît lorsqu'utilisée sur la dentition permanente, des dents antérieures aux dents postérieures. La technique consiste simplement à irradier, pendant deux à quatre minutes, la région à traiter et la turbine à air peut être appliquée directement sur la dent pour diverses préparations en vue de restaurations, incluant les préparations pour couronnes complètes avec un minimum ou même presque sans inconfort pour le patient. Le mécanisme impliqué dans l'analgésie par le laser n'est pas encore très bien déterminé mais peut être associé, croit-on, aux changements de perméabilité de la membrane nerveuse ou au fonctionnement de la pompe à sodium.

Mordançage de l'émail

Le mordançage de l'émail remplaçant l'acide phosphorique représente une autre application sur les tissus durs. Les observations cliniques indiquent que le mordançage au laser est comparable au mordançage à l'acide et que, de plus, il permet une économie de temps de 50 p. cent par rapport à la technique traditionnelle. L'absorption de la longueur d'onde du néodymium par l'émail peut se produire par l'introduction d'un initiateur (une substance organique sombre) dans la région de l'émail à traiter avec un réglage adéquat de la puissance utilisée durant le mordançage au laser. Le contact accidentel avec les tissus mous ne cause donc aucun dommage. De plus, l'irradiation de la dentine exposée provoque la fermeture des tubules; les recherches indiquent que la dentine irradiée est même plus dure que la dentine saine. Une étude portant sur la force de prise des braquettes orthodontiques



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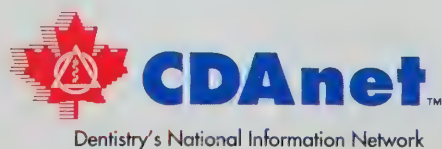
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selon le mode de mordançage utilisé n'a indiqué aucune différence significative entre le mordançage au gel à l'acide et celui au laser. Ceci démontre que le mordançage au laser peut être utilisé pour la préparation des dents en vue de recevoir des braquettes orthodontiques.

Prévention de la carie

Selon les récents résultats de certaines recherches, l'émail humain peut être altéré par l'énergie du laser le rendant moins susceptible à la déminéralisation. Les niveaux d'énergie requis pour produire cet effet préventif ne sont pas assez élevés pour causer des changements visibles à la surface de l'émail. Le laser peut être opéré selon deux modes, à savoir le continu et l'intermittent (ou pulsionnel). Les résultats ont démontré que les effets préventifs de ces deux modes sur l'émail sont comparables mais que les variations dans ces résultats étaient cependant considérablement moindres pour l'exposition par pulsations (intermittent). On croit donc, au moment présent, que dans le mode par pulsations, l'application préventive du laser est plus prometteuse, en tant que technique clinique consistante. D'autres paramètres d'exposition doivent cependant être déterminés en vue d'une compréhension complète de cette application des lasers.

Élimination de matériau obturateur

Des recherches ont démontré que d'une part, le système laser au Er-YAG pouvait être utilisé pour l'ablation d'ancien matériau obturateur et, d'autre part, le seuil d'ablation de tel matériau tend à être inférieur à celui de la dentine saine. Par conséquent, ce processus devient aussi sélectif et ne nécessite aucune extension de la cavité.

Effets de l'irradiation au laser sur la pulpe

Une récente recherche a démontré que le laser au Nd-YAG appliqué pour une période de deux minutes sur l'émail de troisièmes molaires ne causait aucun effet sur

la pulpe (réponse positive au stimuli thermique et électrique). Ceci indique donc que le laser au Nd-YAG peut être utilisé sur l'émail des dents sans en affecter la pulpe.

Endodontie

Des recherches récentes ont été orientées vers la capacité du laser au CO₂ et au Nd-YAG pour sceller les canaux radiculaires. Les derniers travaux avec les lasers qui possèdent des fibres optiques, tels au Nd-YAG, à l'argon ou les lasers dits «eximer»^a ont été investis dans la réalisation de l'ablation du tissu pulpaire. Quelques faits, comme les effets de la radiation ultraviolette sur le tissu, ont été rapportés. Bien que ceci reste encore plus expérimental que clinique, des recherches ont démontré clairement qu'une préparation canalaire pouvait être effectuée de façon adéquate grâce à ces types de laser.

De plus, d'autres recherches ont démontré que le traitement au laser au Nd-YAG réduit de 98 p. cent à 99 p. cent la formation de colonies (CFUs) par rapport à la méthode conventionnelle de désinfection au NaOCl, qui elle, cause une réduction de 88 p. cent.

Le docteur Hatit,¹⁴ lors d'une récente conférence a indiqué que le traitement des foyers d'infection périapicaux peut se faire à l'aide de la fibre optique du laser au Nd-YAG et ceci, sans intervention chirurgicale. Cette procédure s'effectue par stérilisation à travers trois voies possibles : la voie canalaire, la voie de la poche parodontale et, en présence de fistule, par l'ouverture fistulaire.

Traitements para-prothétiques

Outre l'analgésie requise lors des préparations en vue de couronnes, le laser trouve aussi son application dans quelques traitements para-prothétiques. À ce titre, il peut remplacer la corde à rétracter, fournissant un haut degré d'hémostase et un champ opératoire sec permettant d'obtenir une meilleure vue pour préparer les lignes de finition et réaliser des empreintes de grande précision.

De plus, l'irradiation de la préparation en vue d'une couronne ou d'un pont, juste avant l'insertion ou la cimentation finale, diminue de façon considérable la douleur post-insertion.

Parodontie

Dans le chapitre de la parodontie, le laser au Nd-YAG peut servir à enlever les dépôts minéraux sous-gingivaux, lorsqu'utilisé en conjonction avec des méthodes conventionnelles. De plus grande importance clinique, le laser peut, de routine, réduire la profondeur des poches parodontales pour un minimum de deux à quatre millimètres par une procédure dite de curetage au laser, et ceci sans anesthésie, avec peu ou pas de saignement. Un patient type, sujet à cette procédure présenterait des poches parodontales de trois à sept millimètres. La motivation pour conserver une bonne santé dentaire sera d'autant plus grande si le traitement clinique est sans douleur et ne provoque pas ou presque pas d'inconfort post-chirurgical.

Dans le domaine de la parodontie, l'hypersensibilité dentinaire constitue un problème commun. On a démontré que l'irradiation au laser de la dentine exposée réduit totalement ou presque la sensibilité dentinaire. Aucun changement macroscopique ne peut être noté au niveau de la dentine irradiée. La microscopie électronique à balayage révèle cependant que le laser au Nd-YAG referme les tubuli dentinaires. Des recherches ont également démontré un changement dans la conductivité hydraulique (le taux d'entrée et de sortie du fluide à travers les tubuli dentinaires) et un changement morphologique au niveau des odontoblastes. Cliniquement, les patients sont demeurés asymptomatiques pour une période allant jusqu'à deux ans après un traitement unique. Dans ce contexte, quelques chercheurs ont indiqué que le laser, principalement au He-Ne et au CO₂, peut même réduire la sensibilité de la surface radiculaire.



Joint temporo-mandibulaire et occlusion

Dans le domaine de la pathologie des joints temporo-mandibulaires (JTM) affectant l'occlusion, une étude du docteur Hansson¹² décrit la disparition complète de l'inflammation des joints temporo-mandibulaires de cinq patients après l'irradiation aux rayons laser de fréquence de 700 Hz. Le traitement au laser consiste en l'application, pendant trois minutes, pour cinq jours consécutifs, sur la peau au niveau de la région de l'articulation où la douleur est présente. Les paramètres de l'évaluation clinique sont l'ouverture maximale de la mandibule et la présence relative de douleur. Toutefois, une stabilisation réversible préalable (par la fabrication de plaque occlusale) au niveau de la mandibule s'avère nécessaire au succès de cette thérapie.

Chirurgie

Il existe de nombreuses formes particulières ou outils de travail utilisés en chirurgie des tissus mous de la cavité buccale. Le scalpel, dans toutes ses formes variées, constitue le premier instrument chirurgical utilisé dans l'incision et l'ablation des tissus. Son principal désavantage réside dans la difficulté d'obtenir et de maintenir un champ opératoire relativement sec. La venue de l'électrochirurgie a aidé à remédier à ce problème. Cependant, l'utilisation de cette technique comporte d'autres désavantages : marge étendue de dommage tissulaire pouvant causer un retard de la guérison et une cicatrisation plus importante.

Plus récemment, l'introduction des lasers a, d'une part, résolu les problèmes que présente l'électrochirurgie et, d'autre part, apporté de nombreux autres avantages. Il existe des types variés de lasers utilisés en chirurgie (et ses domaines connexes), dont le laser au Nd-YAG, le laser à l'argon, au CO₂ et à l'hélium-néon. Selon leurs propriétés inhérentes d'être absorbées par les différents tissus, leur utilisation est réservée pour différentes procédures.

Absorption par différentes substances

L'opinion des auteurs diffère quelque peu en ce qui concerne l'absorption d'un tel type de laser par tel type de tissu. Par exemple, selon Kaminer et al,⁶ le laser au Nd-YAG est pauvrement absorbé par l'eau, mais préférentiellement absorbé par l'hémoglobine, ce qui rend ce type de laser très efficace dans les chirurgies de la rétine en ophtalmologie et d'autres procédures qui requièrent une absorption privilégiée d'énergie par le tissu cible après le passage du rayon à travers les tissus non absorbants. En contraste, toujours selon le même auteur, le laser au CO₂ possède un très grand coefficient d'absorption pour toutes les substances organiques, incluant l'eau. Ainsi, ce type de laser devient utile presque exclusivement sur la surface tissulaire en vaporisant l'eau contenue dans les cellules individuelles, les faisant éclater, mais ne causant que des dommages négligeables aux structures sous-jacentes.

Par comparaison, selon Pogrel,¹ c'est le laser à l'argon qui, étant bien absorbé par les substances pigmentées incluant l'hémoglobine et la mélanine, est approprié dans les interventions chirurgicales au niveau de la rétine. De plus, il affirme que les lasers au CO₂ et au Nd-YAG sont bien absorbés par l'eau, leur mode d'action étant de vaporiser l'eau et les tissus qui en contiennent (les tissus mous des mammifères contenant plus de 70 p. cent d'eau). Ces tissus sont vaporisés par ces deux formes de laser. Les tissus durs, comme les os et les dents, renfermant beaucoup moins d'eau, ne sont pas vaporisés mais plutôt brûlés et carbonisés. L'élément principal controversé qui en ressort est l'absorption du laser au Nd-YAG par l'eau. Ces deux auteurs s'entendent cependant sur le fait que le laser au CO₂ est bien absorbé par l'eau mais leur préférence pour le laser approprié dans la chirurgie de la rétine n'est pas la même. Finalement, il est pertinent d'ajouter à ce sujet controversé qu'un autre auteur, Garber,⁹ partage l'opinion de Kaminer⁶ sur le fait que le laser au Nd-YAG n'est

pas bien absorbé par les tissus qui contiennent de l'eau.

Pouvoir analgésique

En chirurgie, une des préoccupations majeures concerne le contrôle de la douleur. On a longtemps prétendu que les lasers de faible intensité ont un pouvoir analgésique. Des chercheurs européens ont essayé d'expliquer ce phénomène en alléguant que le message de la douleur est bloqué et/ou que la production d'endorphine est stimulée. Cependant, il ne semble pas y avoir de données bien vérifiées pour prouver ces propos.

Myers,⁵ le directeur de l'Institut pour la dentisterie au laser au Michigan, affirme que des découvertes cliniques ont prouvé que le laser utilisé conjointement avec la chirurgie au scalpel réduisait la douleur post-chirurgicale au point où le patient n'a pas besoin de prendre d'analgésiques. La technique consiste simplement à irradier les surfaces incisées au couteau. Cette méthode d'irradiation selon d'autres auteurs, utilisée avec le laser au He-Ne réduirait significativement les douleurs craniomandibulaires de même que la douleur causée par des ulcères aphteux. Myers⁵ préfère, quant à lui, le laser au Nd-YAG pour une suppression totale de la douleur causée par les ulcères aphteux.⁵

Le docteur Clokie⁷ a récemment mené une étude pour évaluer les effets analgésiques des lasers à l'hélium-néon sur les malaises postopératoires. Il existe, selon lui, deux types de lasers fréquemment utilisés pour l'analgésie : le laser à l'arséniure-aluminium-gallium (rayons infrarouges à 830 nm) et le laser à l'hélium-néon (632,8 nm, lumière visible). Chez quinze patients à qui on a effectué une chirurgie bilatérale mandibulaire des troisièmes molaires on a traité au laser à l'hélium-néon pendant trois minutes un seul côté, l'autre côté servant de témoin. La même approche chirurgicale a été utilisée des deux côtés de la mandibule. L'analyse des cotes d'intensité de la douleur (les résultats) au jour de l'opération et le premier jour postopératoire a indiqué une réduc-



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JOURNAL

March
Mars
1994
Vol. 60
No. 3

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tion statistiquement significative (Chi-carré $P < 0,05$) de la douleur sur le côté de la bouche traité au laser. Au deuxième jour suivant la chirurgie cependant, l'analyse des résultats n'a pas montré de façon statistiquement significative (Chi-carré $P > 0,05$) une réduction de l'intensité de la douleur du côté irradié. Les changements dans l'intensité de la douleur, enregistrés au deuxième jour post-opératoire, peuvent être dus à plusieurs facteurs. Premièrement, le nombre de patients de l'échantillon était petit; ensuite, il a été suggéré que l'effet du laser était optimum lorsque le site chirurgical traité demeurait non perturbé. Suivant l'extraction des troisièmes molaires, le patient peut être tenté de fonctionner d'une façon plus active le deuxième jour postopératoire, ce qui peut traumatiser la région traitée. D'autres scientifiques ont suggéré que plus d'une exposition est nécessaire pour atteindre un effet optimum du laser. En conclusion, cette étude a démontré que le laser à l'hélium-néon (632,8 nm à 10 mW), lorsqu'appliqué au site chirurgical durant trois minutes, immédiatement après l'extraction bilatérale de troisièmes molaires mandibulaires, réduit la douleur postopératoire le jour de la chirurgie de même que le premier jour postopératoire.

De plus, on a suggéré que les lasers à faible énergie accélèrent le processus de guérison des plaies, possiblement par la stimulation de la prolifération des fibroblastes et de la formation de collagène. Dans cet ordre d'idée, une étude utilisant le laser à l'arséniure de gallium à faible énergie, appliqué après l'opération, a suggéré que cette technique peut accélérer le processus de guérison de l'os alvéolaire suite à l'extraction dentaire.

Cependant, une étude encore plus récente, a démontré que le traitement au laser (au As-Ga et au He-Ne) n'est pas une thérapeutique efficace après certaines chirurgies parodontales. Cette étude en double aveugle consistait à effectuer, chez 28 patients, une chirurgie parodontale bilatérale; ensuite un côté était traité au laser, alors que l'autre recevait un traitement placebo. Les

résultats recueillis jusqu'au jour 14 post-chirurgical n'ont démontré aucune différence statistiquement significative entre le côté traité au laser et le côté témoin, en ce qui concerne la guérison et la réduction de la douleur.

Les principaux avantages de la chirurgie au laser

La chirurgie utilisant le laser a apporté certains avantages comparativement aux techniques conventionnelles. Ainsi, on note :

- une excellente hémostase,
- un oedème minimisé,
- un confort relativement plus grand,
- une absence relative de cicatrisation et de contraction de plaie.

Il a été suggéré que les trois premiers avantages sont dus à l'habilité du laser à «sceller» les vaisseaux sanguins, les terminaisons nerveuses et les vaisseaux lymphatiques bien que ce phénomène ait été remis en question. L'absence relative de myofibroblastes dans les plaies en voie de guérison peut être responsable pour le peu de cicatrisation et de contraction de plaie. A cela s'ajoutent, selon Garber,⁹ d'autres avantages :

- moins grande nécessité pour les sutures (par exemple dans les frénectomies),
- économie de temps (dans les procédures comme l'ablation d'hyperplasie papillaire).

De plus, Myers⁵ déclare que le laser au CO₂ minimise la destruction cellulaire en comparaison avec le scalpel traditionnel et l'électrochirurgie. En outre, le laser coagule les vaisseaux sanguins plus petits que 0,5 mm de diamètre pour créer un champ opératoire sec, exempt de sang. Ceci apporte deux autres avantages cliniques : un meilleur champ de vision et un risque presque nul de contamination par voie sanguine. Les infections postopératoires sont également minimisées par l'effet thermique antiseptique du laser.

La bactériémie accompagnant la chirurgie

La cavité buccale est un milieu propice au développement de bactéries et toute ouverture ou cou-

pure dans le tégument oral dans cet environnement peut potentiellement en introduire dans la circulation systémique. Les bactériémies sont souvent les séquelles des procédures chirurgicales au niveau de la bouche. Des hypothèses ont été énoncées indiquant que les bactériémies peuvent être réduites par l'utilisation du laser au CO₂, qui maintient le tégument buccal intact comparativement aux instruments tranchants. Les modalités chirurgicales qui ont été précédemment décrites (le scalpel, l'électrochirurgie et le laser au CO₂) ont été testées pour déterminer l'importance des bactériémies postopératoires dans une étude in vivo avec des animaux servant de modèles expérimentaux.

Pour vérifier l'hypothèse que les bactériémies pouvaient être absentes lors de l'utilisation du laser au CO₂, pour la chirurgie, une incision de 0,2 mm de profondeur fut effectuée sur la surface buccale interne de la joue droite de hamsters, utilisant soit le laser, l'électrochirurgie, ou le scalpel. Une minute plus tard, 1,0 mL de sang était prélevé de chaque animal par ponction cardiaque, inoculé dans un milieu à agar, et incubé anaérobiquement pour quatre jours; ensuite les colonies étaient comptées. La formation de colonies du sang du groupe traité au laser était d'une façon statistiquement significative beaucoup moindre que celle du groupe traité au scalpel ($P < 0,05$). Le groupe traité au laser ne présentait pas de différence statistiquement significative du groupe témoin (le groupe auquel on n'a pas pratiqué d'opération chirurgicale). Ces résultats suggèrent qu'il y a une bactériémie considérable suite à la chirurgie au scalpel et à l'électroscalpel, mais que la chirurgie au laser ne produit pas de bactériémie.

Les possibilités réduites de bactériémie représentent un élément supplémentaire dans l'indication du laser dans le traitement des lésions des tissus mous de la cavité buccale. D'après l'étude de Kammer,⁶ des avantages autres que ceux déjà mentionnés s'ajoutent : réponse inflammatoire diminuée et une plus grande précision, permet-

tant même la microchirurgie. La capacité démontrée de la chirurgie au laser de réduire les bactériémies constitue une explication supplémentaire dans la recommandation de son utilisation chez les patients âgés et/ou atteints de cancer, et chez qui le contrôle de l'infection est crucial.

Les patients immunocompromis, sous chimiothérapie, tels ceux atteints du SIDA ou du cancer, peuvent bénéficier de cette propriété du laser dans les interventions chirurgicales sans entraîner de bactériémie significative. Les patients qui présentent un haut risque d'endocardite bactérienne sub-aiguë comptent aussi parmi ceux chez qui la chirurgie pratiquée au laser est indiquée pour diminuer le risque d'introduction de bactéries dans la circulation systémique.

Les applications

D'après Pogrel,¹ le laser peut être utilisé dans la cavité buccale pour faire l'ablation de différentes lésions des tissus mous. Lorsqu'utilisé en rayon très fin, le laser s'emploie comme un scalpel chirurgical pour pratiquer des biopsies par incision et excision des lésions et, lorsqu'utilisé en rayon plus étendu, il s'emploie pour vaporiser les lésions telles les leucoplasies et autres lésions pré-malignes. Dans le traitement de jeunes carcinomes, le laser au CO₂ a démontré un taux de réussite au niveau local de 77 p. cent, ce qui peut être considéré plus favorable que les autres méthodes d'excision. Dans la vaporisation des leucoplasies buccales et d'autres lésions pré-malignes, le taux de réussite de l'utilisation du laser au CO₂, atteint 97 p. cent. Des résultats très favorables ont été rapportés pour l'utilisation de ce type de laser dans l'excision des amygdales linguales. Une application intéressante a été rapportée dans le traitement de la chéilite causée par les rayons ultraviolets du soleil où la vaporisation de la surface affectée de la lèvre peut être effectuée en clinique externe avec d'excellents résultats esthétiques et fonctionnels. Une autre application du laser au CO₂

consiste en l'ablation des hémangiones, des sur-développements anormaux de la langue chez les enfants, et d'autres lésions chez les personnes présentant une ou des coagulopathies, où l'effet hémostatique devient de première importance.

Cependant, toujours d'après le même auteur, il a été suggéré que la chirurgie effectuée au niveau des gencives en utilisant ce laser peut ne pas présenter un très grand avantage par rapport aux techniques conventionnelles. Finalement, on peut mentionner l'utilisation de ce type de laser dans la chirurgie préprothétique où ses propriétés deviennent particulièrement avantageuses pour le traitement de patients souvent âgés et médicalement compromis.

Bien que relativement rares, les hémangiomes et lymphangiomes de la cavité buccale ont, jusqu'à maintenant, présenté des problèmes difficiles à maîtriser. D'excellents résultats ont été rapportés dans l'utilisation du laser au Nd-YAG lors de l'ablation des malformations vasculaires de la cavité buccale. Le plus grand pouvoir pénétrant de ce type de laser peut être considéré utile et approprié dans l'ablation des lésions vasculaires plus importantes. L'absence relative de fibrose au niveau clinique a été notée avec cette technique.

La thérapie photodynamique

La thérapie photodynamique constitue une application récente des lasers. Cette méthode consiste en l'administration intraveineuse d'éther de (di) hématorporphyrine, une substance chémosensibilisante, sélectivement retenue par les tissus néoplasiques et tissus du système réticuloendothélial. Cette substance, lorsqu'exposée à un laser à l'argon de longueur d'onde de 630 nm, catalyse une réaction photochimique qui libère des radicaux d'oxygène libres cytotoxiques, responsables de la mort cellulaire et donc de nécrose tumorale. Cette technique évite les dommages causés aux structures adjacentes et avoisinantes. Dans une étude récente de Schweitzer, les résultats

ont confirmé l'efficacité de cette méthode. Des rémissions complètes et partielles ont été obtenues chez onze des douze patients (utilisant seize traitements) présentant une variété de carcinomes du nasopharynx, du palais, de la luette, du trigone rétromolaire, de l'os temporal, de l'oesophage cervical et les sarcomes de Kaposi (en relation avec le SIDA) de la cavité buccale.

La compatibilité des lasers en implantologie

En implantologie, il est souvent nécessaire de découvrir un implant dû soit à une perte d'un composant de l'implant, soit à une fermeture des tissus mous sus-jacents à l'implant.

Il n'est pas considéré approprié dans ces cas d'utiliser l'électrocautérisation à proximité d'implants faits de titane car ceci endommagerait l'interface implant-os. De même, les radiations du laser au Nd-YAG sont fortement absorbées par les métaux, ce qui pose un problème pour de telles procédures. Ce type de laser peut détruire la couche superficielle des implants de titane et d'hydroxyapatite recouverts de plasma. Par contre, le laser au CO₂ n'est pas significativement absorbé par les métaux et constitue donc l'outil de choix dans ce genre de procédure.

Conclusion

Se lancer de façon hasardeuse dans ce monde merveilleux de la technologie de demain, que représente le laser, pourrait être un acte irréfléchi. Il convient, de prime abord, de considérer toutes les facettes que présente cet outil extraordinaire afin de ne pas s'effondrer dans l'aspect plutôt obscur de ce domaine.

L'utilisation du laser compte des désavantages dignes de mention: le coût, la difficulté d'accès, la protection des structures adjacentes et la nécessité d'un système à succion de grand volume. En effet, chaque unité de système de laser coûte des milliers de dollars. En raison de ses propriétés physiques, le laser au CO₂, contrairement au laser au Nd-YAG, ne peut voyager à travers un câble à fibres optiques et son utilisation nécessite donc la réflexion de son rayon par un miroir. De



son côté, le laser au Nd-YAG cause de plus grandes zones de nécrose tissulaire et possède un degré de précision moindre, comparative-ment au laser au CO₂.

Les tissus adjacents qui ont le potentiel d'absorber les longueurs d'onde spécifiques des rayons lasers utilisés doivent être protégés. De plus, les professionnels et le personnel de la chambre d'opération doivent être protégés de l'énergie dispersée par le laser, particulièrement au niveau des yeux.

Des études ont démontré la présence de protéines intactes dans l'atour de fumée dégagé lors de la vaporisation des tissus. La possibilité de virus intacts présents dans cette fumée ne peut donc pas être entièrement écartée, d'où la nécessité du port de masque protecteur par toutes les personnes dans la pièce et un système de succion puissant pour évacuer cet atour à sa source.

Les lasers appliqués dans le domaine de la santé ont tendance à devenir l'extrémité guidante dans le concept de la technologie médicale moderne. C'est pourquoi il y a un risque que leur introduction penche plus du côté du prestige et de la réputation plutôt que du côté humanitaire pour le bénéfice du patient. Éthiquement parlant, ceci justifie, d'une part, la nécessité d'une perspective équilibrée des bénéfices de cet instrument et, d'autre part, le besoin fondamental d'avoir une compréhension claire du fonctionnement du système (de la part des deux parties, le professionnel de la santé et le patient) et les compétences requises pour l'opération de ces appareils.

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^a «EXcited dIMER» Un tel système laser produit son rayon grâce à l'interaction entre les ions des gaz nobles (ex. le Xénon et l'Argon), et les ions halogènes comme le fluorure, le chlorure.

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CENTRAL VANCOUVER ISLAND - Strip mall, high exposure, 2.5 days/wk. Lots of potential, flexible transition. Price \$175,000. Reduced to \$149,000.

GULF ISLANDS - Satellite pract. w/potential for sm. full-time pract. Price \$80,000.

NORTH OKANAGAN VALLEY - Rural pract. Est. general pract. Only office in town. Gross \$500,000+. Bldg. purch. optional. Enviably lifestyle for outdoors indiv.

NORTH VANCOUVER - Just off Lonsdale. 3 ops, fully equipped. Well estab. family pract. Practitioner retiring. Call for details. **NEW**

NORTH VANCOUVER - 4 ops, 1480 sq. ft. Est. general pract. in prof. bldg. 15th & Lonsdale. 2nd floor with street exposure to 15th St.

OKANAGAN VALLEY - Est. ortho practice. Plenty of potential for growth. Located in one of the most beautiful areas of B.C.

SOUTH VANCOUVER - 1200 active charts, 3 ops. Beaut. decor. fully equip. 2.5 yrs. old. Plenty of potential. Price \$235,000 (shares). **SO**

VANCOUVER (Downtown) - Beautiful office, 3 ops, flexible transition, lrg. office tower. Price \$115,000 (shares).

VANCOUVER - Est. general practice, south side. 1500 active charts. Gross billings \$400,000+. Large office, street exposure. **SO**

VANCOUVER - Est. practice on the Kingsway. Annual billings \$300,000+. Lots of potential for growth. Low overheads. Price \$199,000.

VANCOUVER - Located in plaza on Kingsway, beautiful decor. 4 ops + 2 plumbed, fantastic exposure. Price \$199,000.

VICTORIA (Downtown) - est. general practice. Over 1200 active charts. Potential for steady sustained growth.

WEST KOOTENAYS - 3 ops, room to expand, enviable lifestyle, store front loc, flex. transition. Price \$175,000.

ALBERTA

CALGARY (Downtown) - 3 ops, modern equip./leaseholds, retiring. High income patients. Great crown and bridge practice. ~~\$225,000~~ Reduced to \$195,000.

CALGARY - Prosthodontic pract., dwtn. prof. bldg., 4 ops, gross billings \$400k, Price ~~\$190,000~~ \$115,000. Great transition. **SO**

CALGARY (South) - 3 ops, strip mall, \$195,000. High exposure. Prof. clinic.

EDMONTON - Established Orthodontic Practice. 20+ full banded case starts per month. Great location. Gross \$700,000+ Four day week. High net practice.

ALBERTA

EDMONTON (Downtown) - Est. endodontic practice in a busy professional building. Beautifully decorated office. 3 ops, fully equipped. Computerized. Flexible transition.

EDMONTON (Downtown) - Est. general practice. Gross \$700,000+. Dentist retiring.

EDMONTON (South) - General dentistry practice. 4 ops, R.I. for an additional 4. New leaseholds. Strip mall location. Computerized. Price ~~\$290,000~~. Reduced to \$187,500.

HIGH RIVER - Est. general pract., 3 ops, 3000 active patients. Growing area. Price \$70,000.

NORTHERN ALTA. - High gross billings, great location, 70 new patients/m, 3525 active charts. Price \$235,000.

RED DEER - General practice. Beautiful office. Enviably lifestyle. 3 ops. Price \$180,000.

ONTARIO

BRANTFORD AREA - 2 fully equipped practices w/excellent growth potential.

DON MILLS - Est. in busy mall location. 2 ops with 1 additional available. **SO**

ISLINGTON - 2-1/2 ops. In strip mall, 2nd flr, ample parking and public transit.

HAMILTON - Great opportunity. 4 ops. Location in busy mall.

KITCHENER - 5 yr old practice, excellent condition. Good gross inc. & patient base. 2 ops, expansive room. **SO**

MARKHAM - Satellite pract. In strip mall w/2 ops. + 1 plumbed and wired.

MISSISSAUGA - Large practice in prominent mall location including 5 ops and 3 orthodontic chairs.

NORTH BAY - 300-400 Patients, 500 sq. ft. in Medical/Dental Building.

OTTAWA AREA - Ground floor, high traffic retail location, c/w 2 equipped ops, w/2 plumbed & wired.

OTTAWA - Excellent starter practice in central location. Owner flexible on terms. Approx. 500 patient base.

RICHMOND HILL - Large store front, prominent mall location. 3 ops with over 2000 active charts. Room for expansion.

ST. CATHARINES - 2 ops w/room for additional 2. In growing area.

TORONTO area - Oral surgery pract. Long time est.

TORONTO (Beaches) - 2-1/2 ops in busy store front location.

TORONTO (Downtown) - Well est. 3 op pract. w/hygiene.

TORONTO (Dundas/Yonge) - 1 op with 3 additional wired and plumbed. Established with good growth potential.

TORONTO - Long est. practice in Gerard east area. Premises can be leased or purchased.

TORONTO (Sheppard/Yonge) - Est. practice in North York. Attractive premises can be rented or purchased.

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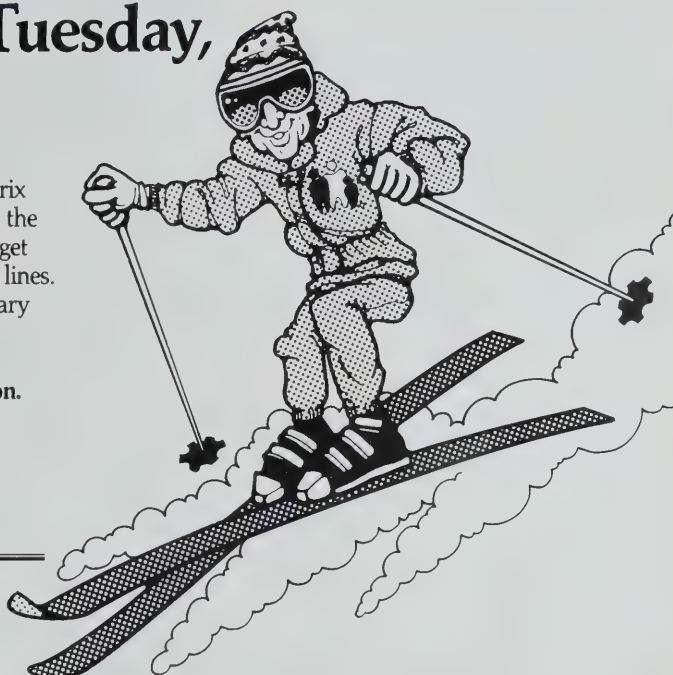
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SASKATCHEWAN - Saskatoon: Two general dental practices for sale. Good gross income at both. Excellent staff. Dentist is moving overseas. Call (306) 978-3384. (03/04)

MANITOBA: Very busy general practice in large town, rural Manitoba, modern office, good growth, ideal for two dentists. Owner returning for postgraduate training, willing to assist in transition. Please reply to CDA ACCESS Box 2566. (04/03)

ONTARIO - St. Thomas: Busy practice for sale, 15 minutes from London. Excellent location. Busy mall, high traffic flow (not tied to mall hours), two and a half years old, 1,800 sq. ft., very modern waiting room, with ball room, Nintendo, Sega, over 1,100 active patients. 40/60 new patients per month, excellent growth potential suitable for one or two dentists. Owner returning to grad school. Call Dr. Reena Gajjar (519) 637-1811. (03/05)

ONTARIO - Ottawa: Space available - Utilize our office when we're not there. Westboro or Hogsback. Ideal for retirement minded general dentist with existing patient base or new grad. Contact Suzan at (613) 226-2808. (03/05)

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High grossing, high profile mall practice in Thunder Bay, four ops, modern equipment, pan etc. 2,000 sq. ft., attractively designed offices. Owner leaving for health reasons. Contact Dental Consulting Services (807) 345-2236. (10/03)

ONTARIO - London : One year's free rent! Offered by The Thorndale Lions Medical/Dental Centre for a dentist to start his or her own dental practice. Situated in a modern (five-year-old) medical/dental building 15 km north-east of London. Contact Paul Massey, R.R. #3, Thorndale, Ont. N0M 2P0, (519) 268-3027. (09/03)

QUEBEC - Hull West: General practice for sale, busy, well-established, computerized, modern equipment, three operatories, 1,800 sq. ft. country dental office, 15 minutes from downtown Ottawa. Yearly gross approximately \$500,000. Owner will assist in transition. Write to CDA ACCESS Box 2605 or call (819) 456-3853, ask for Julia or Michele. (12/03)

NOVA SCOTIA - Halifax: For Sale - Well established family practice located in historic Hydrostone market, computerized, efficient Kavo equipment and excellent growth potential. Contact Bill Tingley at (902) 835-1103. (11/13)

NOVA SCOTIA - Annapolis Valley: Practice for sale in Nova Scotia An-

napolis Valley. Very busy family practice, 1,200 sq. ft. office in a medical/dental professional centre. Ultra-modern dental set-up, good gross, priced to sell. For more information call (902) 245-5666. (04/13)

Positions Available/Sought

BRITISH COLUMBIA - Vancouver: Seeking motivated individual with strong people skills and minimum two years experience for full-time position in clinic, that provides a full range of dental services. Applicant must be willing to work evenings/weekends and desire to learn practice management skills to run office independently. Strong buy in potential for the right individual. Send resume with references and covering letter discussing the ideal type of clinic YOU want to work in. Please reply to Suite 501 - 1477 Fountain Way, Vancouver, BC V6H 3W9.

(03/05)

BRITISH COLUMBIA - VICTORIA

Associate wanted for progressive family strip mall practice in established residential area of city. Owner wishes to extend hours to evenings and weekends (Friday, Saturdays, and possibly Sundays) and seeks individual who is willing to cover this time.

There is potential for a future partnership. Our main concern is quality care. If you are interested please call (604) 595-3345. (02/04)

BRITISH COLUMBIA - Nanaimo: Excellent opportunity for an associate/partnership in the "Hub City" of Vancouver Island. Nanaimo is experiencing fantastic growth. A fabulous lifestyle (world-class fishing, hiking, windsurfing - you name it), and still reasonable real estate prices. If your future is important to you, call (604) 756-1200 (day), (604) 756-1082 (eve). (11/03)

BRITISH COLUMBIA - Kamloops: Full-time associate required for busy, family-oriented, 20 year, team-oriented practice with strong preventive emphasis and very pleasant working environment currently shared by two dentists. Accounts receivable and recall systems fully computerized. Situation is intended for new graduate wanting to work into long term arrangement. Kamloops is a thriving city of 73,000 people, offering easy

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Department of Clinical Dental Sciences

The University of British Columbia

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The starting date is September 1, 1994. Salary will be dependent on qualifications and experience and is subject to final budgetary approval. UBC welcomes all qualified applicants, especially women, aboriginal people, visible minorities, and persons with disabilities. In accordance with Canadian immigration requirements, this advertisement is directed to Canadian citizens and permanent residents of Canada.

Candidates are requested to forward a letter of application (including the names and addresses of three referees whom the selection committee may contact) and a curriculum vitae prior to April 1, 1994. Applications or further enquiries should be directed to:



Dr. Alan A. Lowe, Professor and Head
Department of Clinical Dental Sciences
Faculty of Dentistry
The University of British Columbia
2199 Westbrook Mall
Vancouver, B.C. V6T 1Z3
Telephone: (604) 822-3414
Fax: (604) 822-3562

access to many recreational and cultural activities. Generally dry climate with lots of sunshine and moderate to mild winters. Vancouver is a three hour drive via a four-lane freeway. Please phone Dr. Bob McGinn Monday to Thursday at (604) 374-8191; evenings and weekends at (604) 374-4170. (03/05)

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(07/13)

ALBERTA-CALGARY

Associate Wanted:

Presently seeking motivated associate. Opportunity to develop a practice in a progressive computerized high-volume downtown practice in Calgary. Please reply to CDA ACCESS Box #2615. (02/03)

ALBERTA - Calgary: Presently seeking motivated associate. Opportunity to develop a practice in a progressive, computerized, high volume, downtown practice in Calgary's Bow Val-

ley Square. Please call Veronica at (403) 266-5121. (03/05)

ALBERTA - RED DEER

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General practitioner, Rural Saskatchewan Community. Two operatory, room for expansion. Serving a population of 3,000. Extremely low rental rate, other incentives offered. Two and a half hours west of Saskatoon. For further information, please contact Anthony Hauck at (306) 753-2808 or (306) 753-2988. (03/05)

SASKATCHEWAN - Regina: Seeking dental associate for modern office in large medical/dental facility. Good opportunity for the right person. For details call Dr. Ronald Katz, (306) 924-1494, or write to: 235B Albert

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SASKATCHEWAN - Rosetown: Excellent opportunity for a full-time associate to work with a well-established practice, half-time in Rosetown and half-time at a satellite practice in Eston. If you are a highly motivated dentist looking to work in a progressive environment (fully computerized, highly-trained team members...) away from the city (yet easily accessible to Saskatoon), we would like to hear from you. Buy-in potential exists for the right candidate. Please contact Dr. Glenn Riekman, Box 1690, Rosetown, SK, S0L 2V0. Phone: office (306) 882-2123 or home (306) 882-2006. (02/04)

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ONTARIO - KITCHENER, WATERLOO

Pediatric dentist, full- or part-time associate wanted for busy children's practice in Kitchener. Hospital privileges available. Future partnership possible. Contact Dr. Graham Brydges, office (519) 576-8510 or home (519) 743-7953. (12/03)

ONTARIO - Niagara-on-the-Lake

Associate Wanted: Our office, focusing on a high level of patient care and concern, is looking for an associate. The ideal candidate could be semi-retired from a successful and competent practice, wishing to work three to four days per week, at a relaxed pace, focusing on patient diagnosis, communications and some clinical care. **Please contact Anne, Monday to Thursday at (905) 468-2128.** (01/03)

ONTARIO - Toronto: Orthodontist available, young female orthodontist with experience is seeking employment as an associate/partner in Toronto area. Excellent references, contact "Dr. G." (613) 735-3649 or (613) 687-7416. (02/03)

ONTARIO - Toronto & Area: Burlington, Barrie, Pickering: Enthusiastic dentist seeking associateship position in busy, modern office. One

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The Director of Dental Services will contribute to the multidisciplinary team approach to patient management. Responsibilities include the organization, co-ordination and supervision of the dental services as an integral part of the Churchill Health Centre's programs. Staff inservices and affiliation with the University of Manitoba's student program comprise the educational component of this position.

Qualifications include:

- license to practise dentistry in the Province of Manitoba or eligibility for same
- minimum of one year work experience as a dentist with a background in hospital dentistry being an asset
- demonstrated organizational competence and ability to work independently

We offer an excellent salary, benefit package, subsidized housing and relocation assistance. The position is available immediately. Resumes including references are being received by:

**Human Resources
Churchill Health Centre
Churchill, Manitoba R0B 0E0
Telephone (204) 675-8881
Fax (204) 675-2643**

(03/03)

year dental internship program experience. Personable, hardworking and highly motivated. Willing to work extended hours (some evenings and Saturdays). Please reply with your name and practice location to CDA ACCESS Box 2618 or phone (416) 594-9613. (03/05)

QUEBEC - Quebec City: Lady dentist seeks contract position for 4 to 12 months (suitable for maternity leave or sabbatical leave situation) effective July 1, 1994. Wishes to work in any province outside of Quebec to improve my English fluency. Please contact Ms. Elizabeth Piche at (418) 649-8343 call between 7pm - 10pm. (03/05)

NEWFOUNDLAND - Baie Verte: Busy three-chair computerized clinic. 3,000 active patients, drawing from population of 10,000. Part-time associate available. Owner leaving area in '94. Two to three years left on equipment/computer leases. Asking \$60,000. Call Rob or Gillian (709) 532-8014 (office) or (709) 532-4601 (home). (01/03)

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Meetings & Announcements

ONTARIO - University of Western Ontario: Dental Class of 1984 will be holding its 10 year meeting (Reunion) at the O.D.A. Spring Convention on

Friday April 22, 1994 - location to be announced. Contact Dr. Glen Morawetz at (905) 338-2558. (03/04)

**MAY 27th - JUNE 1st 1994
ALBERTA DENTAL ASSOCIATION
PROVINCIAL DENTAL MEETING**

will be held at the Banff Springs Hotel in Banff, Alberta. For registration or information contact:

**Dr. B. Yaholnitsky, 370 - 202 - 6 Avenue
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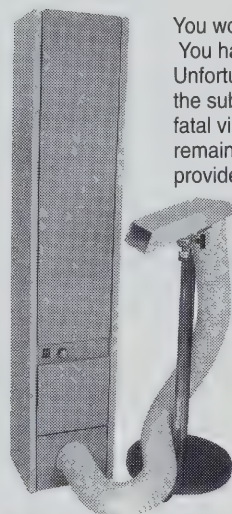
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Miscellaneous

ONTARIO - Ottawa: Microscope Wanted - Phase contrast with video monitor. Contact Suzan at (613) 226-2808. (03/05)

FINE ART PRINTS - FOR SALE

The Black Rhino by John Filipchuk, a limited edition of 250 hand-printed, silk screen prints in 32 colours, 24" x 36" signed & numbered. Regular price \$650.00. Until March 30, 1994 - \$450.00 + taxes prepaid. Brochure \$2.00. **Del Bello Gallery**
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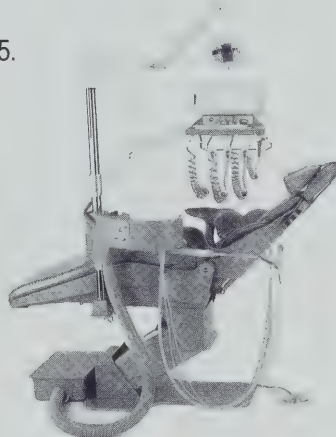
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CONTRAINDICATIONS: Hypersensitivity to the drug. The levels of spiramycin attained in the CSF are much lower than those in the blood and are too low to be clinically useful. Therefore, spiramycin must not be used in patients with meningitis. **PRECAUTIONS:** Administer antibiotics, including spiramycin cautiously to any patient who has demonstrated some form of allergy, particularly to drugs. The possibility of superinfection caused by overgrowth of nonsusceptible organisms should be kept in mind during prolonged or repeated therapy. If superinfection occurs, discontinue the drug and take appropriate measures. **Pregnancy:** Safety of this product for use during pregnancy has not been established. **ADVERSE EFFECTS:** Spiramycin has a low toxicity and rarely produces serious adverse effects; these include epigastric pain and abdominal discomfort, nausea, vomiting, diarrhea and skin sensitization.

OVERDOSE: Symptoms: No case of accidental overdosage has been reported. In oral doses over 4 g/day, abdominal discomfort, nausea or diarrhea may occur.

TREATMENT: No specific treatment has been proposed. Management should be symptomatic. **DOSAGE: Adults:** 6,000,000 to 9,000,000 I.U. (4 to 6 capsules of Rovamycine '500') per 24 hours, in 2 divided doses. In severe infections, the daily dosage may be increased to 12,000,000 to 15,000,000 I.U. (8 to 10 capsules of Rovamycine '500' per day). **Gonorrhea:** 12,000,000 to 13,500,000 I.U. (8 or 9 capsules) in a single dose. **Children:** The usual daily dosage is based on 150,000 I.U./kg body weight in 2 or 3 divided doses; the following calculated dosages are given as a guide (see Table 1). Spiramycin is stable in gastric juices and

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TABLE 1

Dosage in capsules of Rovamycine '250'	
Body weight	(750,000 I.U. Spiramycin/capsule)
15 kg	3 capsules/day
20 kg	4 capsules/day
30 kg	6 capsules/day

absorption is not affected by food. In severe infections, the daily dosage may be increased by one half. In the treatment of beta-hemolytic streptococcal infections, adequate spiramycin dosage should be administered for 10 days. **SUPPLIED: Rovamycine '250':** Each orange and red capsule contains: 750,000 I.U. of spiramycin. Tartrazine-free. Bottles of 50. **Rovamycine '500':** Each grey and red capsule contains: 1,500,000 I.U. of spiramycin. Tartrazine-free. Bottles of 50.

Additional information available from:

Hoechst-Roussel Canada Inc.

Dental Division

4045 Cote Vertu, Montreal, Quebec H4R 2E8

Tel: 1-800-363-1871 FAX: (514) 333-3769

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RHÔNE-POULENC RORER

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PAAB

BOOK REVIEWS

Aesthetic Dentistry with Indirect Resins

By Dr. Howard Stean

1992, Quintessence Books, Chicago

"In dentistry, as in other disciplines, a pent-up demand for cosmetic improvements is being unleashed."

And so Howard Stean unleashes his book on the use of indirect-resins in dentistry. The technique promoted by the author is based on five years experience with the indirect use of "Isosit/Concept" resins manufactured by Ivoclar-Vivadent.

The argument presented by the author for using these materials rests largely on his own clinical experience and on a few published studies, but there is scant reference at the end of each chapter to meaningful clinical, i.e. *in vivo*, research.

Again, as always in books from this publishing house, the drawings and illustrations look very good. Unfortunately, the clinical photographs are dark and distant. Perhaps a long photographic field is a sensible precaution with this subject. However, it does detract a little from the clinical credibility of the book, particularly when the publishers present the author's photographic interests as a manifestation of his connections to the performing arts.

The chapter on the restoration of endodontically-treated teeth describes a technique that incorporates a cast post and core as an integral part of a cast crown — at least that is what the photograph and text suggest. I thought that this technique had been discarded in favor of separate posts and crowns, if only because it is simpler to remove the crown, when required, in the future. I suppose, however, that old (bad) habits die slowly.

The periodontal implications of the treatment shown on some of the posterior teeth are also a concern. For example, the use of an "occlusal rest" from one cast crown to another as a method for eliminating food-packing may worry some den-

tists. Similarly, the idea of splinting four posterior teeth with an intra-coronal resin-bonded bar, where there is no obvious loss of periodontal support, invites at least some doubt about diagnostic judgment. Yet, photographs can be deceiving. Near the end of the book, three very unconvincing clinical examples are offered as "a welcome partner in aiding precise implant prosthesis." There is indeed a very good place for resins on and about implants, but, alas it was not evident here.

Overall, this is an uninspired and dull "show and tell" book with few redeeming features. It looks rushed and seems concocted to sell a product. I recommend that it remain unmarked on the Quintessence order form.

Reviewed by:

Michael I. MacEntee, PhD, LDS(I), Dip. Prosth., FRCD(C) Professor and chairman, division of prosthodontics, University of British Columbia dental faculty.

Oral Pathology — Clinical-Pathological Correlations 2nd Edition

By Joseph A. Regezi and James Sciubba

1993, W.B. Saunders Co., Philadelphia
615 pages, \$69.50 (Cdn)

This is the second edition of an oral pathology textbook that was first published in 1989. Like its parent, it presents the various topics in oral pathology from a clinical perspective. In fact, the authors suggest that the book may bridge the gap between "the didactic aspects of oral pathology and the practical clinical considerations."

The book may be broken down into three parts: chapters 1-9 cover "lesions of the oral soft tissues"; chapters 10-15 explore "lesions of the jaws"; and chapters 16-18 look at "abnormalities of teeth, caries and periodontal disease." Chapter

19, "Common Lesions of the Face," is a new chapter, and includes topics that previously appeared in several chapters of the first edition, as well as some new material.

A summary of its clinical aspects, organized into table form for quick reference, is provided in the book's opening section. This section also contains diagrams and short comments to explain the histopathologic basis of various clinical appearances, as well as helpful advice on the clinical assessment and management of oral lesions.

The section on lesions of the oral soft tissues is presented from a clinical perspective, so that lesions with a similar clinical appearance are described in one chapter. This approach works well in some areas. For example, Chapter 1 brings together vesiculo-bullous lesions caused by viral infections with those due to immunologic defects, while Chapter 5 discusses pigmentation of oral tissues that may be due to exogenous deposits, alterations in melanin production, pigmented nevi or melanoma. The appearance-based approach does not work as well with diseases, which are more complex in clinical appearance, such as lichen planus and lupus erythematosus. Lichen planus is described as one of the white lesions in Chapter 3, while oral lesions of lupus erythematosus are considered under ulcerative conditions in Chapter 2. Yet oral lesions of lichen planus and lupus erythematosus often resemble each other.

Fortunately, some of the troubles with organization are overcome by the excellent sections on differential diagnosis, which usually provide lucid comparisons of the condition under discussion with a short list of other conditions that share important clinical features.

The appearance-based approach also results in the separation of lesions that are closely related, and may represent different stages of one disease, or different manifestations of the same disease. Here, the most obvious example is the separation of leucoplakia (white le-

sions, Chapter 3), erythroplakia (red-blue lesions, Chapter 4) and squamous cell carcinoma of the oral mucosa (ulcerative conditions, Chapter 2), which hinders an effective discussion of the idea of premalignant lesions.

As one moves away from the superficial oral soft tissues, which are readily examined and where many histopathologic changes translate into altered clinical appearances, it becomes less feasible to organize and discuss oral diseases according to their clinical appearances. Thus, lesions involving the submucosal soft tissues are covered in chapters 7, 8 and 9, and are generally divided along the lines of histogenesis. Jaw lesions are discussed in six chapters as: cysts, odontogenic tumors, inflammatory lesions, benign and malignant non-odontogenic tumors, and metabolic and genetic jaw diseases.

Nevertheless, the authors have maintained a clinical orientation through the use of the overview at the front, numerous photographs to

illustrate clinical and radiographic appearance, and the sections on differential diagnosis.

The illustrations in this book are remarkable for their frequency and generally high quality. In addition to clinical photographs, radiographs and photomicrographs, the authors have made liberal use of tables and schematic diagrams. New illustrations have been added to those of the previous edition in many areas of the book.

A bibliography, often quite extensive, is provided at the end of each chapter. The lists of references have been brought up-to-date from the first edition, and the majority of the references cite papers written within the last decade. But while the bibliographies are clearly an excellent source of additional information on the topics covered in the text, they do have one drawback. None of the articles are referenced directly in the body of the text. At the end of Chapter 1, for example, a block of more than 50 references are provided for vesiculo-bullous

diseases of immunologic origin. These references are in alphabetical order by author's name, and the reader has to scan the entire list of references to locate those concerning one particular vesiculo-bullous disease.

Overall, this is a well-written and up-to-date, general oral pathology text. It appears to fulfil the authors' purpose, to bridge the didactic aspects of oral pathology and the practical clinical considerations. For students of oral pathology, the book should be most valuable when used in conjunction with lectures and other textbooks on the pathologic basis of oral diseases. For dentists who wish to have a textbook of oral pathology at hand, this book should be a current and convenient source of information.

Reviewed by:

*Grace Bradley, DDS, M.Sc., FRCD(C)
Associate professor of oral pathology
at the University of Toronto.*

In Communiqué This Month...

- CDA Initiates Campaign to Block Proposed Tax On Dental Benefits
- CDA Lobbies Against Government Plan to Reduce RRSP Limits
- CDA Voices Concerns Over Proposed Changes to Lobbyist Registration Act
- CDAnet Gaining Ground Out West

News

- More On Amalgam
- Regulated Health Professions Act Proclaimed In Ontario
- Mercury-Free Amalgam Under Development

Special Features

- Meet the Founder of the Medical Aid Foundation of Canada — Dr. Paul LaDelpha
- Is Someone Soliciting You For Something?
- Latex Allergies In Patients With Spina Bifida

Look for these stories and more in the March Issue of Communiqué. CDA members receive Communiqué six times per year in the language of their choice as a benefit of membership in CDA.

To join your national association, call 1-800-267-6354.

JOURNAL

March/
Mars
1994
Vol. 60
No. 3

245



82ND WORLD DENTAL CONGRESS • VANCOUVER OCTOBER 2ND TO 8TH, 1994

UPDATE • UPDATE • UPDATE • UPDATE • UPDATE



Dr. Marcia Boyd



Dr. Robert Clarke



Dr. Ron Markey



Dr. Ted Ramage



Dr. James Stich

Introducing ... the people who make it happen



Dr. Michel Jahjah

visionary committee that has stopped at nothing to produce the most outstanding FDI Congress ever!

It is my pleasure to introduce the FDI 1994 Organizing Committee. In alphabetical order, the FDI '94 Committee consists of: Dr. Marcia Boyd, Dr. Robert Clarke, Dr. Ron Markey, Dr. Ted Ramage and Dr. James Stich. Their devotion, focus and proficiency have fostered the development and progress of innumerable Congress preparations and planning.

This fall between October 2 - 8th, 1994, Canada will be host country to the 82nd World Dental Congress. An event that has taken more than 4 years in planning is almost upon us! In just 7 months time FDI '94 will take place in the beautiful and spectacular city of Vancouver, Canada. During the past year, a group of devoted individuals have formed a

Also instrumental in the production of the FDI 1994 Congress are those who work at the Canadian Dental Association's head office in Ottawa. Here, hardworking and competent meeting planners and staff are responsible for all Canadian and U.S. participant registrations, hotel accommodations for all Congress participants, the dental trade show, as well as all communication and press/media relations. An essential component to this team is the CDA accounting department which is working non-stop at keeping all FDI '94 accounts in balance and in order.

FDI '94 has a temporary office in Montreal. It serves as an extension of the CDA family where a great deal of the planning and overall managing originates and develops. This office is particularly responsible for the communication with all of our scientific lecturers, sponsorship, promotion, the needs of tour groups and relations with our insurmountable list of suppliers. It is also integral in the support of international relations.

UPDATE * UPDATE * UPDATE * UPDATE * UPDATE

A vital section of the '94 Congress is the FDI headquarters office in London, UK. Here, the international registrations are processed, worldwide promotion of FDI 1994 is achieved through FDI's main promotional vehicle, Dental World whose distribution covers nearly 100 member countries in four different languages. As well, FDI is responsible for organizing all FDI business sessions taking place during the World Dental Meeting.

The College of Dental Surgeons of BC is contributing to the making of a fruitful FDI 1994 which will be held in their very own vibrant city. The College has been an essential player in helping to promote the FDI '94 to BC dental professionals. The CDSBC has generously encouraged its members to register for the meeting by subsidizing their registration fees before the pre-registration deadline of May 15th, 1994. College staff have been given the responsibility of working on the audio visual and providing support to the Ottawa office.

Last, but not least, are the people that we do not talk enough about – the exhibitors. The exhibitors are working as hard as we are to plan their participation and their booths at the FDI 1994 Exhibit Trade Show. Among these exhibitors are the Sponsors, our corporate partners who are very much involved in making our events happen.

FDI 1994 will be the international dental meeting of the year! It is a must-attend event for every dental team member. In order to make it easier for all of our participants to satisfy their continuing education needs, attendance will be verified at every Congress lecture for all dental professionals. We look forward to welcoming you to Vancouver this October 2 - 8th.

Michel Jahjah, D.D.S.
General Chairman
FDI 1994 Organizing Committee
c/o Canadian Dental Association,
1815 Alta Vista Drive,
Ottawa, Ontario K1G 3Y6

Tel.: 1-800-267-6354
Fax: (613) 523-3062



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FDI
1994

Limited Attendance Courses



STANLEY MALAMED (USA)

**"Pain and Fear and
the Future of Dentistry"**

Sunday, October 2

All-day lecture, presented in English



RONALD FEINMAN (USA)

**"Aesthetic Restorative Procedures,
How, When and Why?"**

Sunday, October 2

All-day lecture, presented in English



CLYDE SCHULTZ (USA)

**"Recession Proof Your Practice:
Strategies for Minimizing the Effects of
Economic Downturn"**

Sunday, October 2

All-day lecture, presented in English



ROY PAGE (USA)

**"Periodontics for the 1990's
and Beyond"**

Monday, October 3

All-day lecture, presented in English



TERRY DONOVAN (USA)

**"Aesthetic Restorative Dentistry
and Materials Update"**

Monday, October 3

All-day lecture, presented in English



FDI
1994

Live Television Presentations



**STEPHEN LEWIS (USA) & PETER
STEVENSON-MOORE (CANADA)**

**"Osseointegrated Implants for the
Partially Edentulous Patient"**

Wednesday, October 5

A.M. presentation in English



**WERNER MORMANN
(SWITZERLAND)**

**"Computer-aided Direct
Ceramic Restorations"**

Thursday, October 6

Noon presentation in English



TERRY DONOVAN (USA)

"Porcelain Veneering Made Easy"

Wednesday, October 5

P.M. presentation in English



"Guided Tissue Regeneration"

Thursday, October 6

(A.M. presentation in English)

— NOTE —

In order to make it easier for all of our participants to satisfy their continuing education needs, attendance will be verified at every Congress lecture for all dental professionals.



HERBERT BADER (USA)

**"Hand and Powered Root Instrumentation:
The Heart and Soul of Periodontal Therapy"**

Thursday, October 6

(P.M. presentation in English)

COME AND SHARE YOUR KNOWLEDGE ...

**Table Clinics,
Free Communications
and Poster Presentations**



Presenting a table clinic, free communication or poster presentation is a rewarding way for clinicians to share their knowledge, research and their own personal experience. These presentations are generally focused on a specific topic of interest or concern to the dental profession and presented in a condensed manner.

Those interested in presenting a table clinic, free communication or poster presentation will need to send in Enrolment Form B along with their FDI Congress registration. Enrolment Form B is attached to the participant enrolment forms found in the centre pages of the *Preliminary Program* or can be obtained by calling the FDI 1994 Organizing Committee at 1-800-267-6354.

Along with their entry form, a clinician will need to submit an abstract of their presentation. This abstract will be reviewed by the Organizing Committee and will be the basis upon which the selection process is made.

This year Unilever Research will be sponsoring a contest for all table clinic entries. First Prize is US \$3000 and a solid silver salver. Second prize is US \$2000 and third prize is US \$1000.



Simultaneous Interpretation



To truly make FDI '94 international, simultaneous interpretation will be available for many lectures in the official languages of the Congress: French, German, Spanish and a few in Japanese. All of the live-television sessions will be simultaneously interpreted for participant viewers. As well, all lectures highlighted in blue in the *Preliminary Program* will also have simultaneous interpretation. Language barriers will be broken as dental professionals from all corners of the world have the opportunity to learn together.

— A —
(\$170 - \$210)

- ☐ Delta Place
- ☐ Four Seasons Vancouver
- ☐ Hyatt Regency
- ☐ Le Meridien
- ☐ Pacific Palisades - Shangri-La Intl.
- ☐ The Pan Pacific (FDI H.Q.)
- ☐ The Vancouver Renaissance Harbourside
- ☐ Hotel Vancouver
- ☐ Waterfront Centre (CDA H.Q.)
- ☐ Wedgewood
- ☐ The Westin Bayshore

— B —
(\$125 - \$155)

- ☐ The Coast Plaza at Stanley Park
- ☐ Delta Pacific Resort & Conference Centre
- ☐ Delta Vancouver Airport & Marina
- ☐ The Georgian Court
- ☐ Holiday Inn Vancouver - Downtown
- ☐ The Landis
- ☐ Listel O'Douls
- ☐ Lonsdale Quay Hotel
- ☐ Plaza Hotel at Wall Centre
- ☐ Sheraton Landmark

— C —
(\$100 - \$120)

- ☐ The Century Plaza Hotel
- ☐ Chateau Granville
- ☐ The Coast Vancouver Airport
- ☐ Holiday Inn Vancouver Centre
- ☐ Hotel Georgia
- ☐ Parkhill
- ☐ Sheraton Gateway Hotel
- ☐ Sheraton Inn Plaza 500

— D —
(Up to \$99)

- ☐ Blue Horizon
- ☐ Burrard Motor Inn
- ☐ Days Inn Downtown
- ☐ Quality Inn Downtown
- ☐ Ramada Vancouver Centre
- ☐ Sandman
- ☐ Skyline Airport
- ☐ Stay 'n Save Motor Inn
- ☐ U. of British Columbia
- ☐ YWCA

There's no place like ... Vancouver in October

The above hotels have been selected to house all Congress participants. These hotels offer a variety of rooms for all tastes and range in value from a mere \$80 to \$210.

Note that hotel occupancy in Vancouver between the months of May to October is over 90%. To ensure that you have accommodations, **do not delay** in sending in your hotel accommodation forms to FDI 1994 in our Ottawa office.

BE SURE TO MAKE YOUR RESERVATIONS TODAY!

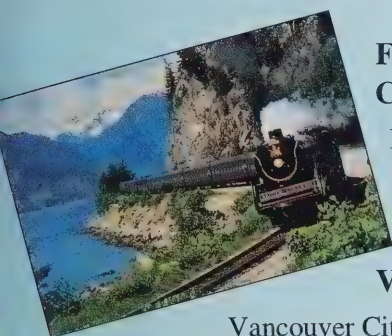
**OUT and
ABOUT
in**

VANCOUVER



Attractions

There are many tourist attractions to fill your stay in Vancouver. The following Children's Programs, Visits & One-Day Tours and Social Programs have been organized for all Congress participants:



Fun and Adventurous Children's Program:

North Shore Excursion ♦ Science World/
Omnimax Theatre ♦ Vancouver Aquarium and
Stanley Park

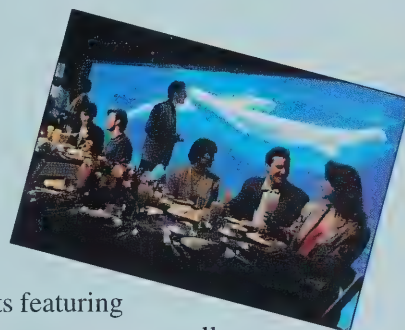


Visits & One-Day Tours:

Vancouver City Tour ♦ Salmon Fishing ♦ Scenic Harbour Cruise ♦ North Shore &
Grouse Mountain ♦ Vancouver Aquarium: "Breakfast with the Whales" ♦ Vancouver City & Granville Island
♦ Royal Hudson Steam Train & Britannia Excursion ♦ Museum of Anthropology ♦ A Day in Victoria
♦ Whistler Mountain Day Trip

Social Program:

Opening Ceremony ♦ International Evening ♦ Scenic Evening Dinner Cruise
♦ Discover the Orient Evening ♦ Salmon BBQ/Logging Show ♦ FDI Ball



Dining Out

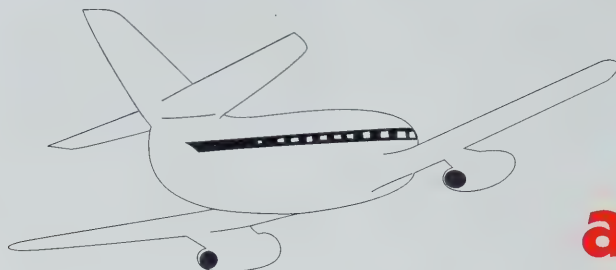
Vancouver's multicultural diversity and Pacific Rim position has created restaurants featuring dishes from all over the globe. Vancouver has several of the best authentic Chinese restaurants as well as fine Vietnamese, Indian, Italian, Thai, Korean and French cuisine. Vancouver chefs take advantage of fresh produce grown year-round and local seafood is often served straight from the ocean. In Vancouver, dining out often comes with a view. Diners can spend the evening at a restaurant on a mountainside overlooking the city and harbour, nestled in the heart of Stanley Park, or at a table by the ocean.



Shopping

Vancouver, with its unique cultural and ethnic diversity, offers a wide variety of exciting shopping opportunities. Native West Coast Indian arts and crafts are among the city's more unique artistic products. Also renowned are jade sculptures and jewelry, whalebone scrimshaw carvings and Cowichan Indian sweaters. Vancouver also offers high fashion clothing and jewelry boutiques found on Robson Street. For an alternative shopping experience, Vancouver has a number of public markets.

Travelling has never been made easier!



**Up, up
and Away!**

Air Canada and Continental Airlines have been appointed the Official Carriers of the FDI '94 Congress in Vancouver. In addition to the convenience of flying on Canada's leading airline, Air Canada is offering special convention rates for those travelling within North America. Also, you can earn valuable Aeroplan or Onepass miles that can be redeemed on any Air Canada or Continental route worldwide.

Take advantage of this valuable offer by calling your travel agent or Air Canada at 1-800-361-7585 (in Canada and the U.S).

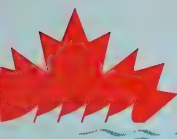
When purchasing your ticket, please ask that our Event Number CV940017 be entered in the Tour Code box and note the Reference Code FDI in the Endorsement box, regardless of the fare purchased.

For participants outside of North America, contact the local Air Canada office for the best available fares.

DID YOU KNOW?

☀ The climate in Vancouver is one of the warmest in Canada. The temperature averages in the mid-70's F (mid-20's C) in the summer months and rarely falls below 25 degrees Fahrenheit (-5° C) in the winter. October is usually mild although evenings tend to be cooler after sunset. Light jackets and sweaters are recommended as are raincoats and umbrellas. The warm coastal climate ensures that the city's trees are lush, its gardens luxuriant and its golf courses evergreen.

☀ Vancouver International Airport is approximately 16 km/11 miles from downtown. An efficient bus service transports you from the airport to downtown at a cost of approximately \$10.00 one way. Many Vancouver hotels also offer complimentary shuttle service. Taxi fares from the airport to downtown are roughly \$27.00. Private limousine service is also available. Please note that **upon departure from the Vancouver International Airport a CDN \$5, \$10 or \$15 tax is payable** depending on your destination.



**FDI
1994**

Pre and Post Congress Tours



ALASKA (September 24 - October 1, 1994)

A memorable 7 night cruise to Alaska aboard Holland America's M.S. Westerdam. Heading up the inside passage, enjoy many delightful ports of Ketchikan (Alaska's first city), Juneau (Alaska's capital) and Glacier Bay (where the mighty glaciers will take your breath away!). A trip of a lifetime!



CANADIAN ROCKY MOUNTAINS (October 8 - 11, 1994)

See the wonders of the Canadian Rocky Mountains on this 4 day/3 night train and bus excursion. Travel through spectacular scenery during the day and enjoy comfortable hotel accommodations at night. You will see a wide variety of wildlife and natural attractions that Alberta and British Columbia have to offer; including the wonderful destinations of Jasper, Banff and Lake Louise.



HAWAII (October 7 - 14, 1994)

Enjoy a fabulous 8 day/7 night vacation in Hawaii on the island of Oahu. You can stay at the Hilton Hawaiian Village or at the Pacific Beach Hotel, both situated on the beautiful Waikiki beach. A perfect tour for those wishing to relax and enjoy the magnificent view of Hawaii.



LOS ANGELES (October 10 - 13, 1994)

Enjoy a marvelous 4 day/3 night cruise aboard Holland America's M.S. Westerdam from Vancouver to Los Angeles along the Canadian and U.S. coast. Since the cruise departs on October 10th, this is the perfect tour for those wishing to do some post-conference sightseeing in Vancouver.



AUSTRALIA AND NEW ZEALAND (October 7 - 21, 1994)

An incredible 15 day/14 night post-conference tour "down-under". In Australia, visit Cairns, the great Barrier Reef, the rain forests, Sydney, the Blue Mountains and go on a wine tour. In New Zealand, see the Coromandel Peninsula and Rotorua thermal springs. You will also have the opportunity to stay either on a sheep, kiwi fruit or cattle farm for two nights. Each farm will host 2 couples from our group – a sure way to enjoy local New Zealand hospitality. From here, optional stopovers for 4 days/3 nights in either Fiji or Hawaii.

The Canadian Dental Association Out-Of-Country Seminar ... In Turkey

April 15 - 28, 1994

in collaboration with the Turkish Dental Association

This unforgettable 14-day journey will take you to the former Ottoman Empire as well as to the modern city of Istanbul. Old and new come together in this country where past, present and future blend to offer the most intriguing and fascinating sites. Through breathtaking landscapes, you will visit a country that stretches from undisturbed coves along dazzling multifaceted coasts to silent peaks of towering mountains. Your voyage will let you discover ancient marble temples built in honor of the gods and stirring architecture reminiscent of times long past. Among the numerous sites at which you will enjoy on this unforgettable trip is Pamukkale, a city where natural springs and thermal water pools flow from terraced cliffs. You will walk through Goreme, an ancient city where 7th century Christians carved shelters directly from the rock formations. Tour also consists of visits to Ankara, Cappadocia, Antalya, Kusadasi and Ephesus.

For more detailed information, contact the FDI 1994 Organizing Committee – at 1-800-267-6354 by telephone or at (613) 523-3062 by fax.

ANNOUNCEMENTS

National Highlights

April 9, 1994
CDA Interim Board of
Governors Meeting
1-800-267-6354

April 21-23, 1994
ODA Annual Spring Meeting
(416) 922-3900

May 12-14, 1994
Newfoundland Dental
Association Annual
Convention
(709) 579-2362

May 26-28, 1994
PEI Dental Association
Annual Meeting
(902) 566-5199

May 28-June 1, 1994
23e Congrès annuel de
l'Ordre des dentistes
du Québec, Les journées
dentaires du Québec,
Montréal, Qc
(514) 875-8511
Fax: (514) 875-1561

May 29-June 1, 1994
Alberta Dental Association
Annual Meeting
Contact: Dr. Kearns
(403) 253-6602

June 2-4, 1994
College of Dental Surgeons
of Saskatchewan
Contact: Dr. Bruce Albert
(306) 693-0755

June 3-4, 1994
Nova Scotia Dental
Association Annual Meeting
(902) 420-0088

June 10-11, 1994
New Brunswick Dental
Society Annual Meeting
(506) 452-8575

October 2-8, 1994
Joint CDA/FDI
Annual Dental Meeting
Vancouver, BC
(613) 523-1770,
or 1-800-267-6354
Tel: (416) 979-4503

April/Avril 1994

Call for abstracts from the American Association of Public Health Dentistry: papers on a broad range of dental health topics for presentation at their 57th Annual Meeting, Oct. 19-21, 1994, in New Orleans, La. The theme of this year's meeting is "Ensuring the Future: Oral Health For All." Deadline for abstract submission: April 1, 1994. For information, contact: Dr. Dennis H. Leverett, Acting Director, Eastman Dental Center, 625 Elmwood Avenue, Rochester, N.Y. 14620. Tel: (716) 275-5001 or (716) 273-1081.

April 8-9: Southern Ontario Surgical Orthodontic Study Group meeting in Windsor, Ontario. For details, contact: Dr. Jeff Berger (519) 258-2632, or fax: (519) 258-2637.

April 15: Application deadline for the Certifying Examination of the American Board of Oral and Maxillofacial Radiology in New Orleans, La. For information, contact: Dr. Lars Hollender, Dept. of Oral Medicine SC-63, U.W. School of Dentistry, Seattle, WA 98195. Tel: (206) 543-0615.

April 20-24: Annual International Educational Seminar of the American Academy of Cosmetic Dentistry, in Phoenix, Arizona. For information, contact: Ms. Maureen Steckman, executive director, AACD, 2711 Marshall Court, Madison, Wisconsin 53705.

April 21-24: Irish Dental Association Annual Scientific Conference, in Waterford City, Ireland. For further details, contact: Ms. Margaret Ferguson, Irish Dental Association, 10, Richview Office Park, Clonskeagh Rd., Dublin, 14.

April 21-23: British Dental Trade Association Dental Exhibition, at the NEC Birmingham. For information, contact: The British Dental Trade Association, 84 High St., Slough, Berks SL1 1EL, U.K.

April 24-26: Joint meeting of the Canadian Academy of Endodontics & Australian Society of Endodontology at the Maui International Wailea Hotel in Maui, Ha-

waii. For information, contact: Dr. Wayne Pulver, President, Canadian Academy of Endodontics, 159 Willowdale Ave., Willowdale, Ontario M2N 4Y7. Tel: (416) 222-9900

April 27-May 1: 51st Annual Session of the American Association of Endodontists (AAE) at the Hilton Hawaiian Village in Honolulu, Hawaii. To register, contact: American Association of Endodontists, Annual Session Registration, 211 E. Chicago Avenue, Chicago, Illinois, 60611-2691. Tel: (312) 266-7255.

May/Mai 1994

May 14: Alberta Academy of Periodontology is holding a continuing education course entitled Current Concepts in Periodontics. For further information, contact: Dr. Albert Frydman, (403) 288-3334.

May 22-28: International College of Dentists Annual Meeting — European Section at the Jerusalem Hilton Hotel in Jerusalem. For details, contact: Dr. S. Sussman, Secretariat, ICD European Section, P.O. Box 50006, Tel Aviv 61500, Israel.

June/Juin 1994

June 2-4: Academy for Sports Dentistry Meeting in Pittsburgh, Pennsylvania. For information, contact: Dr. A.W.S. Wood, 1553 Randor Dr., Mississauga, Ontario L5J 3C6. Tel: (905) 823-2008.

June 6-10: 12th National Congress on Dentistry (Latin-American Meeting on Dentistry) at the Havana International Conference Center in Havana, Cuba. For more information, write: Palacio de las Convenciones, Apartado 16046. La Habana, Cuba.

June 6-17: Pindborg Course in Oral Pathology given on the premises of the Danish Dental Association in Copenhagen, Denmark. For more information, contact: Anne Grethe Ingversen, Secretary, Dept. of Oral Pathology, School of Dentistry, University of Copenhagen, 20 Norre Allé, DK-2200 Copenhagen N., Denmark.

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³ Steven E. Duke, D.D.S., M.S.D., University of Texas Health Science Center, San Antonio, Clinical Evaluation of Prisma Universal Bond 3 Adhesive System.

A JOURNAL

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April/Avril 1994
Vol. 60 No. 4

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Published monthly by the Canadian Dental Association at 1815 Alta Vista Drive, Ottawa, Ont. K1G 3Y6. Copyright 1982 by the Canadian Dental Association. Authorized as Second Class Mail, Registration Number 5384. Postage paid at Ottawa, Ont.

Notice of change of address should be received before the 10th of the month, to become effective the following month.

Subscriptions: All subscriptions payable in advance in Canadian funds. In Canada - \$48 (+ GST); United States - \$53; all other - \$58.

Subscriptions are for 12 issues, not necessarily conforming with the calendar year. All statements of opinion and supposed fact are published on the authority of the author who submits them and do not necessarily express the views of the Canadian Dental Association, unless such statements or opinions have been adopted by the Association. The editor reserves the right to edit all copy submitted to the Journal. Publication of an advertisement does not necessarily imply that the Canadian Dental Association agrees with or supports the claims therein.

ISSN 0709 8936

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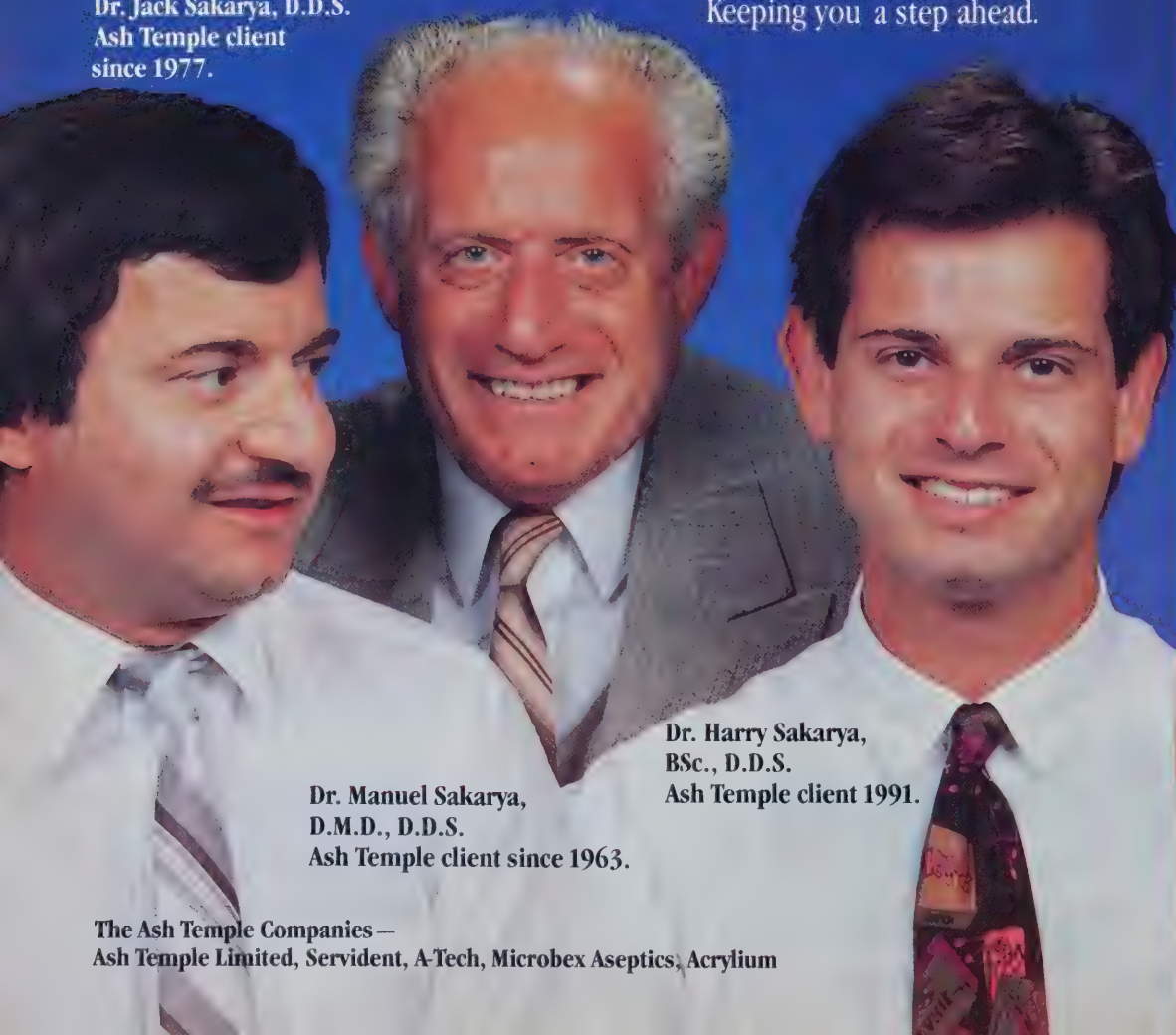
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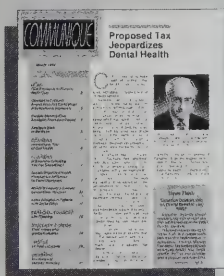
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of the Journal.

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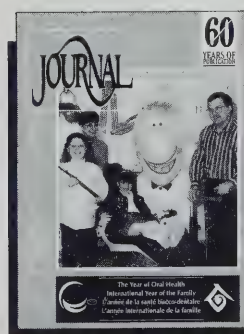
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Cover: Year of the Family —
Year of Oral Health. (Photo-
graph by Teal Photography.)

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LETTERS



Oral Cancer Diagnosis

The recent extensive advertising campaign promoting a product containing toluidine blue and described as an "Oral Cancer Diagnostic System" has prompted us to write this letter.

Cancer of the oral mucosa is always clinically detectable due to changes in the appearance and/or consistency of the affected tissues. Visual examination and palpation are the only clinical procedures necessary prior to biopsy.

Squamous cell carcinoma of the mouth may present as a hyperkeratotic area, as an ulcer, as a lump or thickening, as an area of erythroplakia or as a combination of two or more of these. Whenever a lesion showing such features is found, it must be biopsied to establish its precise pathological nature regardless of its reaction to toluidine blue. The biopsy should be taken from the part of the lesion that is most indurated. In extensive lesions it may be necessary to take more than one tissue sample.

Staining of dysplastic squamous epithelium by toluidine blue is a phenomenon that has been known for many years.³ There is no scientific evidence to support the suggestion that its use will lead to earlier diagnosis of oral cancer. False negative results may result in delays in diagnosis and treatment. Silverman et al² reported an accuracy of 91 per cent for toluidine blue diagnosis of oral cancer. As it may also stain inflammatory lesions and surface debris, false positives are common.

Several authors^{1,2,3} have advocated the routine use of toluidine blue in the investigation of suspected oral cancer, but although many people in the field, including most of us, have used it on a trial basis, few have found it sufficiently valuable to adopt it as a routine.

Clinicians who choose to use toluidine blue should be mindful of its possibly misleading results and should never postpone biopsy on the basis of any reaction to this dye. Cancer of the mouth can only be diagnosed by clinicians with prepared minds using educated eyes and finger tips leading to prompt biopsy.

J.D. Awde, Victoria Hospital, London, Ontario

K.C. Bentley, Montreal Hospital, Montreal, P.Q.

J.H.P. Main, Sunnybrook Health Science Centre, Toronto, Ontario.

W.G. Maxymiw, Princess Margaret Hospital, Toronto, Ontario.

W.T. McGaw, Cross Cancer Institute, Edmonton, Alberta

R.W. Priddy, Vancouver Hospital Health Science Centre, Vancouver, B.C.

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Response From Germiphene Company

We have reviewed the above letter to the editor. While nothing can replace experienced clinical judgement, toluidine blue rinse (Orascan) is a valuable adjunct to the practitioner's "prepared mind, educated eyes and finger tips."

Early stage asymptomatic lesions are frequently difficult to identify by practitioners who do not have a great deal of experience in the recognition of oral cancer. With the

use of toluidine blue rinse, even the smallest oral carcinomas stain an intense blue.^{1,2} Mashberg³ has shown a four-fold improvement in diagnosis when using toluidine blue and visual examination versus visual examination alone. Using a 10-14 day retest to allow inflammatory lesions to heal reduces false positives to 8.5 per cent and false negatives to 1.9 per cent, yielding a rate of accuracy far superior to other cancer diagnostic tests such as the Pap smear, PSA, etc. (A second positive stain and/or clinical suspicion mandates biopsy.)

Toluidine blue rinse:

- is useful in identifying early asymptomatic squamous cell malignant changes which lack later-stage signs and symptoms — palpability, ulceration, obvious mass or bleeding.¹⁻⁴ (Later-stage symptomatic lesions are more readily diagnosed.)
- aids in identifying second primary cancers and lesion borders for biopsy and surgical excision.
- has significant support in the literature for its use as a cancer diagnostic adjunct.⁵⁻¹⁰
- provides the dentist with added impact in persuading patients to stop smoking or drinking to excess which could put them in the high risk group.

Every year, over 1,000 Canadians die because of oral cancer. More than 3,000 develop the disease. Only half survive more than five years. Over the past decade, these statistics have shown little change. The key to reversing these statistics is early detection. Toluidine blue rinse does play a valuable role in this effort.

We must base our opinions upon published studies and research; not upon anecdotal information.

*Joel Epstein, DMD, MSD
British Columbia Cancer Agency,
Head, division of oral medicine
and clinical dentistry, Vancouver
General Hospital*

*Benoit LaLonde, DMD, MSD
Associate professor and specialist*

in oral medicine, University of Montreal

Arthur Mashberg, DDS
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Martin Tyler, DDS
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Family Violence

The Canadian Dental Association and the *Journal of the Canadian Dental Association* are to be congratulated on the November 1993 issue of the *Journal* that was dedicated to Family Violence.

In June 1993, Health Canada requested that CDA recognize the importance of an awareness of family violence issues. Health Canada indicated that the health educators who prepare future practitioners should be aware of this issue, recognize the needs at an early stage, and be able to deal with family violence-related concerns at the individual, family, and community level.

The CDA council on education proposed a motion with regard to family violence at its June 1993 meeting. The CDA board of governors approved the following motion in September 1993:

That the Canadian Dental Association recognize the need to increase the awareness level of graduate dentists, dental hygienists, and dental assistants regarding the issues relating to family violence.

That dental and allied dental education programs be encouraged to provide opportunities for future health care providers to become more aware of issues related to family violence; and

That these statements be distributed to all accredited dental education programs, accredited dental services, and the program development committee of the Association of Canadian Faculties of Dentistry.

The program that was initiated by Health Canada and coordinated by Joan Simpson, family violence coordinator of the Mental Health Division, has proceeded with an ad-hoc planning group for the Preliminary Development of Family Violence Practice Guidelines for the Dental Community. This planning group, of which I am a member, met February 3 and 4, 1994, to develop the planning process for utilization by all dental professionals. This group is evaluating what needs to be achieved and what is possible and practical in the dental office and in public health dentistry. Once again, thank you for providing the corporate support, library support, and Journal support for this very important social issue.

G.W. Thompson,
DDS, M.Sc.D., PhD
Chairman, CDA council
on education

Editors Note

An overview of the planning group for developing family violence guidelines appears on page 277 in the "News Update" section of this *Journal* issue.

Journals to Latvia

I wish to acknowledge receipt of two copies of the January 1994 issue of the *Journal of the Canadian Dental Association*, which marks the beginning of the yearly subscription donated to the Latvian Dental Project by CDA. I am also grateful for CDA's efforts in gathering together *Journals* from the past five years.

The current issues are now on their way to Latvia, where they will be placed in the library of the Latvian Medical Academy for the use of staff and undergraduates. The five-year bundle will be included in my next shipment at the end of February.

Again, thanks to CDA for its meaningful support of our humanitarian effort in Latvia. It is very heartening for me to see my association involving itself in this kind of "outside" good works.

Silvija Janusonis, DDS
Brampton, Ontario

It's The Law

I read with interest your report on the seminar "Ontario Law and the Dentist," at which I had the honor of speaking last October.

One of the comments that you attribute to me in your very kind description is not exactly what I intended to say. In discussion of the topic of civil liability, I suggested to the participants that if, in a particular case, their dental skills do not keep them out of trouble, it is unlikely that their legal skills will get them out of trouble.

In other words, when something does go wrong and a claim appears likely, it is of the ultimate importance that the incident be reported immediately to the malpractice insurance program, whether the member is covered by the Royal College of Dental Surgeons, The Order of Dentists of Quebec or Canadian Dentists' Insurance Program.



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Your readers may be interested to know that plans are already under way to repeat the "Ontario Law and the Dentist" program in the fall of 1994.

*James M. MacMillan, BA, LLB
Administrator, RCDS Professional
Liability Program*

Dental Fraud

I welcomed the comments made by CDA president Dr. Raymond Wenn in his December 1993 column, "Dental Fraud — A Betrayal of Trust."

The insurance companies do have a role to play in dental fraud and we as dental consultants are part of that role. However, companies are restricted in how much information they can obtain in an investigation. The profiling done by companies may indicate possible fraud but they have no way to investigate this further other than through the licensing bodies. In the past, the reaction of these bodies has been varied across Canada.

The provincial licensing bodies, by acting on possible cases of abuse brought to their attention by the insurance companies, have been and are criticized for doing the dirty work of the industry. It is my view that this rank and file attitude has slowed progress and cooperation in this important area.

*William A.F. Norgate
President, Canadian Association
of Dental Consultants*

Cost of Implants

I recently inserted an implant-supported crown on tooth # 22 of an 18-year-old patient. Implant-supported prostheses are surely the greatest advance in dentistry in this century, and our thanks has to be expressed to the people who have developed the techniques.

However, while implants are fantastic, they are also expensive. This patient's costs included \$1,500 for surgery, plus \$800 for the crown, or a total of \$2,300 to replace a single missing tooth. I estimate that the oral surgeon made \$1,200 for about an hour's work, the restorative dentist made \$335 for approximately 1.25 hours, and the laboratory made

about \$200. The other \$600 represents the cost of the implant body, abutment, and screws, etc.

The need for implants is greatest now. Twenty years down the road, the market will be much smaller. Rather than putting the "screws" to relatively few patients because the fees are exorbitant, we should be trying to render this service to many more patients. The oral surgeon/periodontist should reduce their fees. This is not a difficult surgical procedure. The profession should also bring pressure on the "Branemark Empire."

*William McJannet, DDS
Beafield, Quebec*

Editor's Note

The *Journal* asked Dr. George K. Scott, president of the Canadian Academy of Restorative Dentistry and Prosthodontics, to comment on Dr. McJannet's concerns. Dr. Scott writes:

Thank you for the opportunity to comment regarding the disgruntled implant practitioner.

I wonder at the extent of his experience, given his reference to 1.25 hours to complete the prosthetic section of the work. I assume diagnostic casts and radiographs were obtained, and a placement stent designed and constructed with the surgeon. Also, of course, a temporary prosthesis would be required which needs to be altered to accommodate tissue healing once the transmucosal component has been placed by the surgeon.

Once the transfer impression was secured, I hope that design and color were checked to provide tooth color and functional satisfaction to this sensitive area of the mouth.

One also expects that this young person has been advised that remakes of the superstructure will likely be necessary as the dentition matures.

I will leave comment on the surgical section to the surgeon, except to note that the price has been reduced considerably over the years since introduction. There are many alternate systems already available to the practitioner, and I hope each of them is as carefully researched and manufactured,

and offers the same security as the Branemark system to its recipients.

It also needs to be noted that alternate forms of replacement are available depending on the maturity and condition of the adjacent teeth and tissue and the patient's preference.

*George K. Scott, DDS
Hamilton, Ontario*

Grieve Memorial Lecture

I read with interest the article, "New Fund Coordinates Dental Giving," published in the January 1994 issue of the *Journal*, particularly the section related to the Grieve Memorial Lectureship Trust.

However, I was disappointed that no mention was made of the long-time, on-going and generous support of the Canadian Association of Orthodontists to the presentation of this prestigious lecture at each annual meeting of the Canadian Dental Association.

*Terry D. Carlyle, DDS, M.Sc.
Past President, Canadian Association
of Orthodontists*

ERRATA

An error appeared in the caption of the right-hand photograph (**Fig. 2**) on page 144 of the February 1994 issue of the *Journal*. The caption, which accompanied the article "A Fissure Sealant Pilot Project In a Third Party Insurance Program in Manitoba," should have read: **Fig 2:** Sealant on a nine-year-old patient's tooth #46 for three years.



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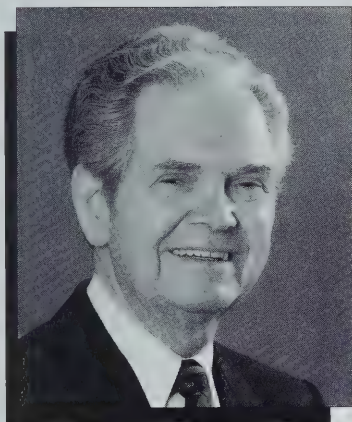
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EDITORIAL

1994 — THE YEAR OF ORAL HEALTH... WHY CAN'T IT BE LIKE THE WINTER OLYMPICS?



Dr. P. Ralph Crawford,
Editor

If you're wondering how the Olympics sneaked into a column on oral health, well, my deadline arrived just as the 17th Winter Olympics in Lillehammer, Norway, were drawing to a close. And like millions of people around the world, I was moved by the triumph and tears of 16 days of intense competition, and by the sheer ability and determination of the over 2,000 world-class athletes who competed for medals and Olympic glory.

The 1994 Olympics somehow seemed to have every ingredient for success. From the very first moments of the opening ceremonies, a certain winning combination could be sensed. Who, among the vast television audience, was not enthralled by the glory of the Nordic winter wonderland and the simplicity and sincerity of Liv Ullman's and Thor Hyerdahl's introductions. Who could forget the joyful innocence of those hundred's of smiling children. And then that breath-taking leap of the Olympic torch off the end of the ski jump.

We Canadians thrilled as our own athletes skied, skated and shot like no other Olympic team before — 13 medals in all. We were held in awe by Norway's Johann "King" Koss winning three gold medals, knowing that last fall, as a medical student, he had interrupted his Olympic training to visit the poor in Africa, and later donated much of his Olympic money to the children of the world who are victims of war.

Despite the circus atmosphere of the Kerrigan/Harding tragedy (and it is tragedy when talent is debased), the 17th Olympic Winter Games seemed to have a previously unknown sensitivity. More than any other Olympics, they were the Games with the human touch. The Games where politics was far removed from sport, where the environment was a priority, and where phrases such as "peace and protection of life on our wonderful planet" were not uncommon.

But the pathos of man's inhumanity to man was not totally forgotten. At the closing ceremonies, as 40,000 spectators switched on their flashlights, prayers of silent peace and supplication rose for war-torn Sarajevo — where only 10 years before the people of the then Yugoslavia had rejoiced in their role as hosts to the athletes of the world.

Yes, the sponsorship of the 1994 Olympics was massive. And yes, it boggles the mind to think about how much Coca Cola, The Royal Bank, Ford, Canadian Tire, McDonalds and the other major sponsors spent to promote their products, and what other worthwhile endeavors that money could have gone to. But there is no doubt that their sponsorship contributed to the ultimate success of the Games.

Now it's April, however, and the Olympics are over. It's time for two of 1994's other major events to take centre stage, and capture the hearts of nations — the Year of Oral Health and The Year of the Family.

The idea of a full year dedicated to oral health was first suggested by Professor Keki Mistry of India. The idea caught on. In 1992, the World Health Organization (WHO) resolved to dedicate April 7, 1994, as World Health Day, and in May 1992 the FDI council resolved to declare

the entire year of 1994 as The Year of Oral Health. At the same time, the United Nations has named 1994 as The International Year of the Family.

In effect, 1994 will be a year-long opportunity for organised dentistry, worldwide, to focus and intensify the promotion of oral health and oral health care. Canada is playing a leading role in the process by providing the venue for one of the major events. Next October, when FDI holds its annual world congress in Vancouver, the theme of the week-long event will be World Focus on Oral Health.

Unlike the Olympics, however, where only a select few enjoy an opportunity to compete, individual dentists need not sit back and play the spectator role in the Year of Oral Health — we can be active participants. Actually, we already have a great starting-point advantage. We know that over 90 per cent of all oral disease is preventable, and we have the skills to capably deal with the other 10 per cent, which is genetically and developmentally acquired. We also have the best of all possible training facilities — our own dental practices. It is there, on a daily basis, that we can begin to achieve some of the goals and purposes set forth for the Year of Oral Health.

We can work to improve the public's perception of our profession through promoting dental awareness, we can strengthen our profile with the media, and we can seek to improve public access to dental treatment. Equally important, we can do everything possible to enhance our own professional satisfaction through working for improvements in oral health and quality care — at home and abroad.

Canadian dentists can and should make Olympic style efforts to show the world that we are gold medal contenders in the Year of Oral Health. McDonalds — the home of the Big Mac — said it first, but it's still a great line: "We share the belief that anything is possible when you have a dream."

P. Ralph Crawford, DMD
Editor of the *Journal of the Canadian Dental Association*

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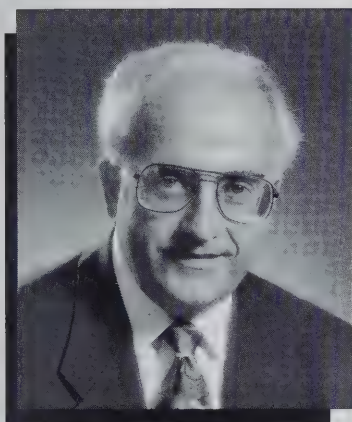
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PRESIDENT'S COLUMN

UNITED WE STAND



Dr. Raymond Wenn,
President of CDA

While dentists across Canada should be pleased that CDA's recent lobbying efforts led Finance Minister Paul Martin to reconsider his plans to cut RRSP contribution limits and place a tax on employer-paid dental benefits, we cannot let down our guard just yet.

Prior to Mr. Martin bringing down his February 22 budget, it was clear that most Canadians agreed with the finance minister's assessment of the country's burgeoning deficit. Like the minister, they have come to see the deficit as a huge problem that must be resolved and quickly.

But while Mr. Martin gave "average" Canadians an opportunity to express themselves on the deficit crisis, by holding four regional conferences to seek their input, it isn't clear that he listened to what they said. Canadians told Mr. Martin that deficit reduction should be brought about by cuts in government spending, not direct tax increases. In late December, however, the media reported that the finance minister was considering a new tax on employer-paid health and dental benefits, and that he planned to reduce the allowable tax deduction limits for RRSP contributions. Mr. Martin apparently hoped that Canadians would buy into his argument that these revenue-

generating measures would not only help to reduce the deficit, but also remove a number of the existing "inequities" in the current tax system.

Both proposals would have had a serious, extremely negative impact on the dental profession. The first measure would have resulted in RRSP contribution limits dropping from the \$15,500 they were slated to reach in 1996 to a mere \$8,500 — or pre-1982 levels. This would have seriously compromised the ability of dentists, their staff, and other self-employed Canadians without access to registered pension programs to plan for their retirement. Rather than eliminate an inequity in the current tax system, this measure would have actually discriminated against self-employed Canadians.

Mr. Martin's second proposal probably seemed fairly innocuous to ordinary Canadians at first glance, largely because its impact on their personal tax burden was not immediately obvious. But the measure, which the finance minister projected could raise close to \$1 billion, would have been catastrophic for both dentists and patients alike. Once Canadians woke up to the fact that the proposal would increase their personal tax bill by as much as \$500 to \$1,000 per year, many of them would have no doubt opted out of their employer-paid dental benefits program, putting their dental health in jeopardy.

And as non-insured Canadians began to reduce the frequency of their dental visits because of financial concerns, the "busyness" of Canadian dentists, as well as their overall contribution to the Canadian economy as small businessmen, would also decline.

As you know, Mr. Martin eventually backed away from both of his controversial budget proposals. And as you should know, CDA and its corporate and individual members deserve much of the credit for bringing about the finance minister's change of heart.

From the moment CDA learned of Mr. Martin's proposals until the minute he brought down his budget, our issue management team went into high gear. Within weeks, CDA's taxation committee, chaired by Dr. Robert Hicks, prepared effective,

hard-hitting briefs on both issues. These briefs were sent to Mr. Martin and the leaders of the opposition parties. At the same time, CDA mailed information packages to members asking them to voice their own opposition to the proposed measures, and to encourage their patients to follow suit. To facilitate this, CDA prepared special pre-printed letters against the dental benefits tax, which dental patients could send to Mr. Martin and their local MP. Association spokespeople also participated in several media interviews, and CDA placed an advertisement in the *Globe and Mail* stating Canadian dentistry's opposition to the dental benefits tax. A similar advertisement was placed in the *Toronto Star* by the Ontario Dental Association.

Clearly, the Canadian Dental Association played a leading role in convincing Mr. Martin to change his budget plans, thereby protecting not only our members, but also the oral health of all Canadians. We spoke with a united voice on behalf of all Canadian dentists, and we did so effectively and well. The results speak for themselves.

But the fight to maintain equitable RRSP contribution limits for self-employed Canadians, and to ensure the tax-free status of dental benefits is far from over. Mr. Martin has stated that the limits for RRSP contributions will be included in a broad review of both public and private pension systems later this year, and indicated that his recent decision on the dental benefits tax may not be the final word.

I sincerely hope that nonmembers of CDA will consider these facts when they receive CDA's 1994 membership solicitation material. If all Canadian dentists remain united in their national association through membership, they will be a force to be reckoned with, as CDA's recent lobbying successes make clear. But if more dentists choose to go their separate ways, as nonmembers, our force will be divided, thereby reducing our ability to speak as effectively and strongly on behalf of the entire dental profession.

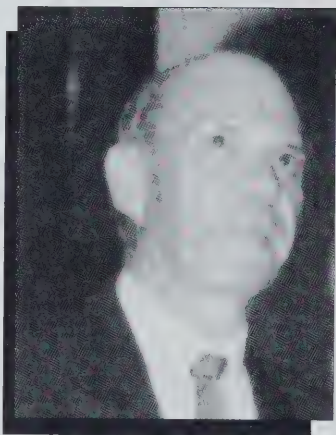
Raymond Wenn, DDS
President of the Canadian Dental Association

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GUEST EDITORIAL

A World of Oral Health



Dr. Clive B. Ross
President of FDI

The dental profession has many good reasons to be proud of its work and achievements in oral health and oral health care. From science to practice, from broad preventive programs to sophisticated clinical technology, the profession and the industry have worked hand in hand with the common goal of improving the quality of life of the peoples.

This work and further developments in the service of the profession to the general public are continuous — every day and every year — all over the world.

Hundreds of thousands of individuals — dentists, staff members and others — are involved in this work. Many associations, public and voluntary organisations, and the consumer products' industry are all actively promoting oral health. Optimal oral health for all peoples is also a principle mission of FDI (the Fédération Dentaire Internationale).

At all levels, 1994 has the potential to be very special:

■ **1994 The World Year of Oral Health** — has been declared by FDI

■ **The World Health Day, April 7, 1994** — organised by the World Health Organisation (WHO) — is dedicated to oral health.

The main purpose is to offer a series of opportunities to highlight and promote improvements in oral health and other important and topical oral health care issues — not instead of, but in addition to, the existing programs.

You and all your colleagues around the world are indeed constant front runners in the professional "mass movement" for oral health. The millions of daily, direct and personal contacts between profession and patients offer basic and ideal opportunities for promoting oral health and quality care, and for improving the relationship between the profession and the general public.

The global idea of the Year of Oral Health has initiated considerable interest and creativity among many associations and organisations — in support of their members and their goals for the year.

However, the oral health situation and the conditions for dental care vary enormously between continents, countries and communities in the world. A program suitable in one area would not necessarily be suitable in another, due to the differences in many factors such as manpower, resources, cul-

ture, traditions and oral health status.

The same is true for various slogans — to be effective, to communicate well to people, they have to hit the right tone and carry an important message, easily understandable in the environment and culture in which they are used. Witty and punchy slogans are always difficult to translate from one language to another, from one culture to another.

The emphasis would also have to be different in different countries. In some areas, the implementation of broad preventive programs is the most urgent issue. In other areas, a further sophistication of an already high level of oral health and oral health care is the issue.

But irrespective of the local situation, optimal oral health through the best possible oral health care, for as many people as possible, is our professional responsibility and assignment — as individual dentists as well as through our organisations.

1994 is a unique opportunity. But the outcome, consequences, and the effects of the activities during 1994 will certainly stretch far beyond the year. Our work for a World of Oral Health is, indeed, long term. ■

Dr. Clive B. Ross
President of FDI



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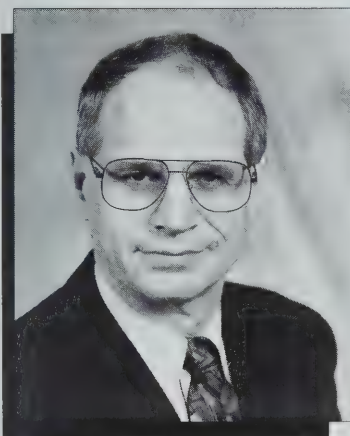
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NEWS UPDATE

MDA Elects New President



Dr. Mark Buettner

Dr. Mark Buettner of Winnipeg was elected president of the Manitoba Dental Association (MDA) January 27 during the association's 110th annual meeting.

A 1970 graduate of the University of Manitoba's dental faculty, Dr. Buettner has maintained a private general dentistry practice in Winnipeg since 1972. He was first elected to the MDA board of directors in 1989, and has served as a part-time instructor in the Manitoba dental faculty for more than 20 years.

Those serving with Dr. Buettner on the 1994 MDA board of directors are: Dr. Tom Dobbs, vice-president; Dr. Jan Brown, past president; and directors, Drs. Craig Fedorowich, Barry Rayter, Murray White and Ed Yauch. ■

Manitoba Launches "Free First Visit" Program

As part of its ongoing public education program, the Manitoba Dental Association (MDA) has launched a Free First Visit program for children under three years of age. Through the program, a child's first dental visit, which includes an introduction to the dental office as well



Dr. Lanny Jacob (right), coordinator of the MDA Free First Visit program, responds to questions at a press conference during the Manitoba Dental Association's annual meeting. Looking on are MDA president Dr. Mark Buettner (far left) and past-president Dr. Jan Brown (centre).

as a routine oral examination, is provided without charge.

Funded by dentists, MDA and Manitoba Health, the program is scheduled to be in effect for three years. It is anticipated that the vast majority of Manitoba dentists will participate. ■

Dentsply Continues CDA Commitment

Dentsply International's recent merger with GENDEX Corporation will not affect the company's long-standing relationship with CDA.

In a recent press release, Mr. John J. McDonough, Dentsply's new vice-chairman and chief executive officer, emphasized that the company remains committed to its ongoing professional relations activities, including the Student Clinician Programs it sponsors around the world.

"Our partnership with the Canadian Dental Association and its counterparts in other nations is a source of great pride for our company," Mr. McDonough said. "We will continue to support this worthwhile program as we are convinced it holds great value for all parties involved."



Dentsply International merges with GENDEX Corporation: (left) Mr. Burton C. Borgelt, chairman of the Dentsply board; (right) Mr. John J. McDonough, Dentsply's new vice chairman and chief executive officer.

The CDA/Dentsply Student Clinician Program will mark its 24th anniversary next October in Vancouver during the 1994 FDI World Dental Congress.

One of the world's leading manufacturers and distributors of dental supplies and equipment, Dentsply merged with GENDEX Corporation last June. As a result, Dentsply went from being a privately-owned company to become a public entity.

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Following the merger, Mr. Burton C. Borgelt, formerly the chairman and chief executive officer of Dentsply International, became chairman of the board of the new Dentsply. Mr. McDonough, who was chairman and chief executive officer of GENDEX prior to the merger, is now Dentsply's vice-chairman and chief executive officer. ■

Dental Faculties Targeted In University Budget Cuts



The University of Manitoba dental faculty.

A proposed restructuring plan could lead to the closure of the University of Alberta's dental faculty at the end of the 1997-98 academic year, while dental students at the University of Manitoba are likely to be faced with large tuition fee increases.

On February 4, 1994, University of Alberta president Dr. Paul Davenport released *Quality First*, a document that outlines 15 specific proposals for restructuring the university. Proposal Number 1 calls for the closure of the faculty of dentistry at the end of 1997-98 academic year. This would include the DDS and dental hygiene programs, as well as the university's graduate programs in orthodontics and oral biology. If it goes through, the closure will affect more than 120 students and eliminate the jobs of about 100 faculty members and staff.

The release of *Quality First* comes in response to the Alberta government's pledge to cut support to higher education by 20 per cent over the next three years.



The University of Alberta dental faculty.

Before they can be implemented, the proposals contained in the document must pass through a series of university committees, ending with the board of governors. If they survive that process, they will then move on to the minister of advanced education's office for approval. However, Proposal Number 1 could be stopped at any one of the committee or board stages.

The rationale for closing the dental faculty falls into four main areas: cost, insufficient world-class research, a belief that the faculty's mission is not basic to many of the university's activities, and a belief that the faculty does not maintain a high level of interaction with the overall university community.

Dr. Norman Wood, the dean of the University of Alberta's dental faculty, has initiated an offensive strategy to demonstrate the fallacy of the administration's rationale and to determine the faculty's *raison d'être*. The Alberta Dental Association and the Albert Dental Hygienists' Association have joined the campaign to save the faculty, and a team of external consultants has been engaged to evaluate existing programs and make recommendations.

Most importantly, says dean Wood, before the university board of governors or the minister of advanced education would take the faculty closure proposal seriously, Alberta would need assurances from other provinces that it could buy 30 spaces in their dental schools on an annual basis.

The Alberta dental faculty, founded in 1917, was the only Canadian dental faculty west of Toronto until 1958, when the Manitoba dental faculty was established.

In Manitoba, a University Education Review Commission report, re-

leased in Winnipeg January 21, stated that the province of Manitoba can no longer afford to increase funding to universities while underfunding community colleges.

The commission, appointed by the Filmon government in 1992, was chaired by former Manitoba premier and retired senator Duff Roblin. At a press conference, Mr. Roblin said that more money should be spent on community colleges, and that universities should concentrate on their strengths and be prepared to eliminate marginal programs and services.

Dentistry was singled out as one of the faculties where students should pay more for their education. The committee noted that the University of Manitoba has no policy on tuition fee structure, and recommended that future fee increases move toward having all students pay the same percentage of program costs.

A review of 17 faculties showed that dental students, paying fees of \$3,097 per year, were the most expensive to educate at a cost of \$55,829 per student per year. In comparison, it cost only \$5,076 per year to educate an arts student paying fees of \$1,756 per year.

Other faculty comparisons were: medicine, cost/student \$30,576, tuition \$3,097; law, cost/student \$13,941, tuition \$2,195; pharmacy, cost/student \$12,565, tuition \$2,212; and education, cost/student \$6,500, tuition \$1,788.

In presenting this comparison, the commission report said: "It is notable that among those students receiving high public subsidies and paying a low percentage of cost are those who subsequently may earn high incomes in their professional lives."

The fate of the 90-page report and its 41 recommendations is unknown at this time, but Manitoba Education Minister Clayton Manness said that the government would respond by the end of March. ■

WHO/PAHO Fellowship Details Announced

On behalf of Health Canada, the Canadian Society for International Health has announced details of the

annual competition for fellowships for Canadian citizens wishing to undertake short-term studies abroad.

Some 10 to 15 fellowships, worth up to a maximum of \$5,000 (U.S.) each, are expected to be approved this year through the annual World Health Organization/Pan American Health Organization fellowship competition.

Health personnel eligible to apply include individuals who have finished their formal professional training, have several years of experience, and now wish to continue their professional development in a health-related field relevant to their work. People engaged in pure research, undergraduate and graduate university students are not eligible to apply.

Applications must be received before June 30, 1994. Additional information can be obtained by contacting: WHO/PAHO Fellowships, Canadian Society for International Health, 170 Laurier Avenue West, Suite 902, Ottawa, Ontario K1P 5V5. Telephone (613) 230-2654 (ext. 309) or Fax, (613) 230-8401. ■

McGill Dental Faculty Awarded \$4.04-Mil- lion Research Grant

A \$4.04-million research grant to study implant bone bonding has been awarded to the faculty of dentistry at McGill University.

Called Project Osteo-Bond, the initiative is headed by Dr. Cameron Clokie, assistant professor in the department of oral and maxillo-facial surgery and director of the bone integrated implant research group.

The three-year research project will investigate the nature of the biological interaction between growth factor TGF-1 and titanium implants placed in bone. Traditionally, titanium implants are left to "rest" or heal within the bone during the process of osseointegration, before being uncovered and loaded with a prosthesis. Dr. Clokie's group will research the potential of using growth factor to speed up the integration process, which may eventually lead to the development of a single surgery implant procedure.

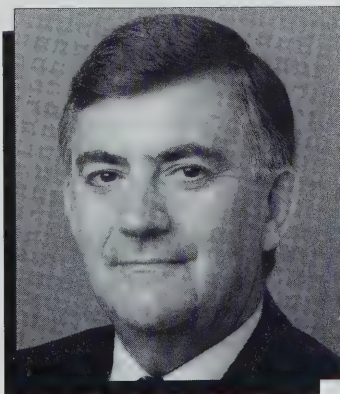
The project has been coordinated by SYNERGIE, a Quebec gov-



Dr. Cameron Clokie (seated left) discusses Project Osteo-Bond with supporters and co-workers. Left to right: Mr. Guy Hudon of Guy Hudon Inc.; Dr. Patrick Merat, vice-president, scientific affairs, Bristol-Myers Squibb; Ms. Christine Poon, president, and general manager, Bristol-Myers Squibb; Mr. Jean Gagne, president of the Comité de gestion du programme Synergie; and Dr. Dwayne Rahal, scientific coordinator, Project Osteo-Bond.

ernment program that encourages interaction between universities and industry. Bristol-Meyers Squibb Pharmaceutical Group will contribute \$2.4 million worth of supplies to the project, while Guy Hudon Inc. of Boucherville, Quebec, will supply the research team with materials valued at \$500,000. ■

UWO and Minsk Dental Faculties Join Forces To Help Chernobyl Children



Dr. Gerald Wright

As a direct off-shoot of the "Children of Chernobyl" aid campaign,

the faculty of dentistry at the University of Western Ontario (UWO) has entered into a collaborative agreement with the Minsk Medical Institute to help children in Belarus receive adequate dental care.

Western will mount a fund-raising effort to implement a five-year program in which the university's pediatric dental department will assist in the training and updating of Minsk dentists, set up a contemporary, well-equipped demonstration clinic for teaching purposes, provide education and scientific materials, and conduct joint scientific research in pediatric dentistry.

In a February 9 press release, Dr. Gerald Wright, UWO's assistant dean, continuing dental education, said: "It's a wonderful opportunity for our community to contribute what we can on an international level to supplement the dearth of information, materials, and teaching that now faces pediatric dentistry in Belarus. By Western standards, most equipment and teaching methods employed by the Minsk faculty are from the 1950s."

Dr. Wright was part of a fact finding team that was invited to Belarus late last spring to examine the status of pediatric dentistry.

"The Chernobyl accident has left the area with a significant number of children suffering from radiation-induced immune deficiency, or "Chernobyl AIDS" as some doctors

call it. These children require special dental attention," he said. ■

New Health Care Video Released

A video primer has been produced to help immigrants and refugees to Canada become acquainted with Canada's health care system.

Health Care in Canada is available in 22 different languages and, depending on the language selected, runs between 33 and 45 minutes. Co-produced by the Manitoba Interfaith Immigration Council and the Citizenship Council of Manitoba, it was initially intended to inform new Canadians about Canada's health care system. However, since its release, the video has proven to be useful to anyone interested in an overview of Canada's health care system — how it works, what the various health professions are, and how to access the system.

The film starts with the genesis of the National Health Care System in the 1950s, and introduces the viewer to the basics of Canada's tax-supported health care structure — who is eligible, how to register, and individual rights. The introduction is followed by a step-by-step overview of access to preventive medicine, the roles of the various health professionals, and emergency and hospital care.

Based on the premise that new Canadians, in particular, need help to understand Canada's complex network of health care, the video gently deals with many of the social issues of the day, from family violence, sex education, abortion, AIDS, and substance abuse to the care of the elderly.

Funding for this excellent video was provided by a variety of government and private agencies, including the Kahanoff Foundation, Employment and Immigration Canada, Multiculturalism and Citizenship Canada, Health Canada and the National Film Board.

The video is available for \$23.50, plus shipping and taxes. For more information, call the Manitoba Interfaith Immigration Council Inc. at (204) 477-4483 or fax (204) 478-8159. ■



Mr. Mark Sarner (centre) discusses *The Canadian Dental Consumer* in the '90s seminar with interested dentists during the annual meeting of the Manitoba Dental Association last January.

Dental Consumer Seminar Draws Large Crowds

CDA's Canadian Dental Consumer in the '90s seminar continues to draw large crowds across the country.

Co-sponsored by CDA and Ash Temple Limited, the lecture is presented by Mr. Mark Sarner of Manifest Communications. The three-hour presentation gives participants an inside look at the forces affecting patient care today. Among other topics, it explores: how dental consumers are changing and why, what the needs of today's new patients are, and the techniques required to keep patients returning to dental offices again and again.

For further information on CDA's Canadian Dental Consumer of the '90s seminar, call CDA membership services at: 1-800-267-6354. ■

Journal Contributes To World Oral Health

The *Journal of the Canadian Dental Association* is contributing to the World Oral Health program in 1994 by providing complementary subscriptions to underdeveloped areas of the world.

Responding to special requests from areas where there is a dearth of scientific literature, the *Journal* is

now being mailed to university medical and dental faculties in Cambodia, Nigeria, Thailand, Syria, Belarus, Ukraine, Nairobi, Latvia, Estonia, Bulgaria, Slovakia,

Depending on accessibility and costs, while the *Journal* is sometimes mailed directly overseas by CDA, the program is usually a joint effort between the association and a Canadian sponsor. In most cases, magazines are provided free of charge to sponsors, who then send them to another country at their cost. Interested readers may contact the *Journal* editor for more information. ■

Planning Group To Develop Family Violence Guidelines

Family violence — including child abuse, violence against women, and abuse and neglect of older adults — represents a serious abuse of power within family, trust or dependency relationships. And in many cases, family violence is not something that just happens to strangers. It can occur in our families, as well as those of our neighbors, our friends and our co-workers.

These sobering thoughts were high on the agenda of an "Ad Hoc Planning Group for the Preliminary Development of Family Violence Practice Guidelines for the Dental Community" meeting, held February 3, 4, 1994, in Ottawa.

The 10 participants at the meeting, chaired by Joan Simpson of the Health Services Directorate, Health Canada, were drawn from the professions of dentistry, dental hygiene, dental assisting and dental therapy.

Over a four-year period (1991-1995), the Mental Health Division, Health Canada, has been given the mandate to work toward broadening the awareness and sensitivity of health professionals to family violence issues, as well as to related gender and control issues. In addition, the federal Family Violence Initiative has assigned the division the task of helping health service providers to respond appropriately and effectively to family violence. From the start, the Mental Health Division has worked collaboratively with national organizations and others to encourage the development of training and resource materials for use by front-line health service providers as well as educators. This work eventually led to the appointment of an ad hoc advisory group on the dental community's response to family violence issues.

Representatives from CDA, the Canadian Dental Assistants Association and the Canadian Dental Hygienists Association sat on this group, which was ultimately responsible for the 1993 publication, by Health Canada, of *Family Violence Resource Materials for the Dental Community: an Annotated Bibliography*. This comprehensive bibliography of publications of interest to the dental community is available from Publications Health Canada, 19th Floor, Jeanne Mance Bldg., Tunney's Pasture, Ottawa, ON K1A 0K9. Other family violence materials are available from the National Clearinghouse on Family Violence, Health Canada: 1-800-267-1291.

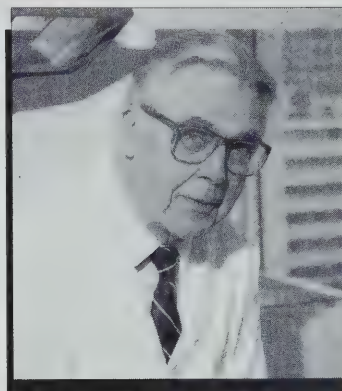
At their February meeting, members of the Ad Hoc Planning Group discussed how practitioners see and respond to violence issues in their practice settings, as well as how to build a greater awareness of these issues among practitioners in a range of practice settings, and how to begin to deal with the issue of family violence in community practice, in services to residential settings, and in preparing future health professionals. The participants also debated the role of professional associations,

provincial and territorial governments, and accreditation bodies in interacting with the dental profession on family violence issues. The meeting concluded with a focused discussion on what type of published materials would help members of the dental community to maintain and increase their awareness of family violence. ■

W. Ross Upton Dead At Age 76

Dr. W. Ross Upton of Richmond, B.C., died February 20, 1994, after a lengthy battle with cancer.

Dr. Upton, who graduated from the faculty of dentistry at the University of Alberta in 1942, was a prominent figure throughout his life — both within the profession he loved and the communities where he lived.



Dr. William (Ross) Upton

Following graduation, Dr. Upton served with the Royal Canadian Dental Corps and saw service in Britain and Holland. In 1946, shortly after his army service came to an end, he began private practice in Calgary.

Known as a caring, gentle man to his thousands of patients, Dr. Upton

"WHAT'S IT?"

February "What's It" Solved

The identity of the small, grey, diamond-shaped particles described in the February "What's It" has been solved. Our thanks for identifying the particles as ingots of copper amalgam goes out to: Dr. Vlastimil Bazant, Outlook, Sask; Dr. Arthur J. Breglia, Toronto, Ontario; Dr. Joan Lodge, New Westminster, B.C. and Ms. Joan Gibson-Harnum, a registered dental hygienist in Dr. William Lardner's office in Halifax, Nova Scotia.

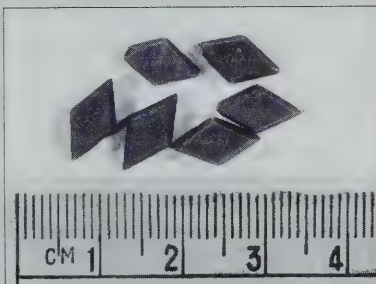
Special thanks is extended to Ms. Gibson-Harnum for sending us an entire box of the S.S. White copper amalgam ingots, dating back as far as the 1920s. They have been placed among the "amalgam display" in the CDA museum.

Of particular interest are the instructions accompanying the copper amalgam — particularly in these days of mercury mania.

1. Heat in iron spoon over a flame, never using more than enough ingots to cover the floor of the spoon.
2. When minute globules of mercury appear on the surface of the ingots, remove to a cooler area. When these globules enlarge in size, place in the mortar.
3. Grind under the pestle until all traces of granular amalgam are removed. The longer the trituration, the greater the plasticity.
4. Knead in the palm of the hand, which will increase plasticity by thoroughly distributing the mercury throughout the mass.

Do you have a dental artifact that needs identification?

Perhaps our readers can help. Send the item, or a clear photo, to Dr. Ralph Crawford, Editor of the *Journal of the Canadian Dental Association*, 1815 Alta Vista Drive, Ottawa, ON K1G 3Y6. ■



found time to immerse himself in countless community and dental projects. He was a past-president of the Calgary and District Dental Society, served as a Calgary alderman for two years, was vice-chairman of the Calgary General Hospital, vice-president of the Canadian Rocky Mountain Tourist Association, and vice-chairman of the local zoological society.

Dr. Upton moved to Vancouver in 1956, where he quickly renewed his commitment to organized dentistry. At one and the same time, he was executive director of three different dental organizations — the College of Dental Surgeons of B.C., The B.C. Dental Association, and the Vancouver and District Dental Society. In the days when there were 1,800 dentists in British Columbia, it was said that Dr. Upton knew them all by their first name.

He is survived by his wife Irene and daughters Judy and Janice. ■

The Year of Oral Health — The International Year of the Family

The Fédération Dentaire Internationale (FDI) supports the principle that all people should have access to the best possible dental care to achieve optimal oral health. This, in fact, is one of the principle missions of FDI.

FDI's logo depicts this mission:



- The World — a stylized globe, symbolizing FDI's worldwide efforts.
- Oral Health — a stylized smile, symbolizing health and happiness.

- The FDI Logo — symbolizing and representing the dental profession of the world.

International Year of the Family.



The heart sheltered by a roof, linked by another heart, symbolizes life and love in a home where one finds warmth, caring, security, togetherness, tolerance and acceptance. The open design indicates continuity with a hint of uncertainty. The brush stroke, with its open line roof, completes an abstract symbol representing the complexity of the family. ■

Dr. James Cyril (Flin) Flanagan Dead At 96

Dr. James Flin Flanagan, who opened the first free dental clinics for children in Griffintown, Quebec, died March 12 in Ste. Anne de Bellevue, Quebec. He was 96.

Dr. Flanagan served Canada with distinction during the First World War, suffering serious wounds in the battle of Passchendaele. Despite his injuries, he became a football star for McGill University after the war. Following his graduation, he established the first free dental clinics for children in Griffintown, one of the poorest areas of Montreal.

Known as a social activist, Dr. Flanagan was involved in a number of special causes throughout his career. Of particular note was his 1920's co-founding of the 20 Club, a debating society that would later count Pierre Elliot Trudeau among its members. ■

Obituary

Birdsell, Dr. Dennis Calvin: Dr. Birdsell graduated from the University of Manitoba's faculty of dentistry in 1971. He died March 7, 1994.

Boin, Dr. Lucio, J.: Dr. Boin graduated from the University of Western Ontario's faculty of dentistry in 1988. He died in January 1994.

Boyles, Dr. William: Dr. Boyles graduated from McGill University's faculty of dentistry in 1941. He died in December 1993.

Florence, Dr. Max: Dr. Florence graduated from the University of Toronto's faculty of dentistry in 1950. A former resident of Ottawa, he was active in the promotion of fluoridation in the 1960s. He died March 3, 1994.

Kearney, Dr. Leonard Joseph: Dr. Kearney graduated from the University of Toronto's faculty of dentistry in 1951. He died October 16, 1993.

Link, Dr. Herbert E.: Dr. Link graduated from the University of Alberta's faculty of dentistry in 1978. He died January 11, 1994.

Palmer, Dr. Don: Dr. Palmer graduated from the University of Toronto's faculty of dentistry in 1950. He died in January 1994.

Sylvestre, Dr. Gerard: Dr. Sylvestre graduated from the Université de Montréal's faculty of dentistry in 1948. He died December 8, 1993.

Upton, Dr. W. Ross: Dr. Upton graduated from the University of Alberta's faculty of dentistry in 1942. He died February 20, 1994.

Woo, Dr. Duke: Dr. Woo graduated from the University of Manitoba's faculty of dentistry in 1983. He died in March 1994.



THE DANGERS OF SECTIONALISM IN CANADA

APRIL, 1935

Wherein the National Policies of Our Forefathers Are Again Emphasized

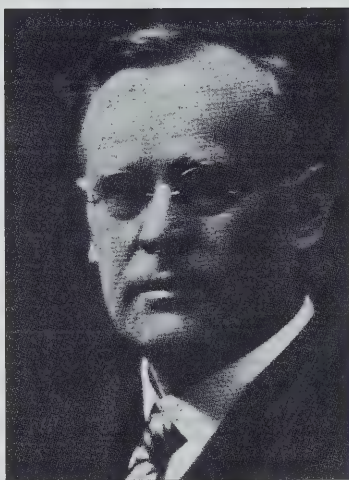
By W.C. Keirstead, MA, PhD, DCL,
University of New Brunswick

WE IN Canada are peculiarly liable to sectionalism and to its evils. Our Confederation was one of sparsely populated provinces, separated from each other by vast stretches of wilderness lands, often unbroken by highway or railway or other means of communication. Those provinces had little trade or communion with each other. Each was isolated and provincial in its life, the one tie that united them being their loyalty to the British Crown.

The two main provinces were of different race, and brought into the union the racial differences and attitudes they had experienced prior to the federation. In fact, Confederation was, as Goldwin Smith has said, the child of this racial or political deadlock.

Canada is composed of very different economic provinces. The Eastern provinces face the Atlantic and have their markets over the seas and to the south. The St. Lawrence River area, with its cheap transportation, its varied and rich resources of raw materials, its enormous water powers and its comparative density of population, is a manufacturing country. The vast Prairies produce wheat for a world market, and need cheap transportation and low costs of production; whereas our Western province faces the Pacific and has economic resources and interests peculiar to itself.

The fact that these provinces had an organized political existence prior to their union, tends to perpetuate the spirit of sectionalism. Moreover, the peculiar relation of our governments to each other, with overlapping of federal and provincial functions, and with only general and vague con-



W.C. KEIRSTEAD

stitutional delimitations, promotes contention and provincialism. The present prolonged depression, with its increased expenditures and decreased provincial revenues, has accentuated provincialism, until, as Professor Leacock has recently told us, we seem to have lost the aspirations and great hopes of our Fathers. He declares that now we are all province men. He does admit that the Prime Minister and himself are yet Canadians, but, he asks, are there others? I venture to enrol myself with these distinguished gentlemen only because I feel, that in addition to these two Elijahs, there are many thousands of our Canadian citizens who have not bowed the knee to Baal or worshipped at his altar of sectionalism.

60

Racialism

For a time, racialism made national unity almost impossible. It distorted issues in Parliament and before the electors; it made heroes of the fanatic and the demagogue; it appealed to emotional complexes and prejudices, and stifled the voice of reason; and it diverted our energies from true issues to false ones. Yet, in spite of racialism, we are learning co-operation and fellowship, and are appreciating the language, literature, arts, and culture of both races. We are coming to see the value of tolerance, sympathy, understanding and goodwill in religion, and to agree with Sir Wilfrid Laurier that: "Faith is better than doubt and love is better than hate." Are we not finding unity in a higher synthesis and one that comprehends our differences of race and creed?

National Policies

Our federal government has embarked upon great policies of development, transportation, immigration, and protection, to overcome economic sectionalism, to increase interprovincial trade, to develop national resources, and to promote economic and political unity. A commission of the Province of Nova Scotia has unanimously reported that these national policies have, on the whole, been detrimental rather than helpful to that province. It declares also that by reason of the protective policy, high costs of transportation are included in price and shifted from the manufacturing to the outlying areas. It would be valuable to have a similar report from every other province. Perhaps even the central provinces, who get most of the protection, might claim that they have paid quite highly for free markets, which, after all, comprise less than one-half the population of Canada. Perhaps there has been net economic loss in subordinating economic interest to political ideals. A national ideal is largely an emotional valuation. Since the great war, Europe has been redivided into numerous small nations to satisfy racial and national sentiments, with the result of restricted trade and heavy economic loss to all concerned.

Trade on this continent moves naturally north and south more than it does east and west. But our neighbors have also their policy of economic nationalism, and we decided at Confederation that we would maintain political independence.

That our protective policy has given regional advantages and disadvantages must, I think, be admitted. Further, some provinces are fortunate in having more of these prosperous areas than others; and consequently greater prosperity and more buoyant provincial revenues. Is our na-

tional policy to seek the development of the resources and areas that will give the largest return in present and future prosperity, without regard to provincial situation, or is it to seek for an equality of prosperity and development in each province, without regard for the opportunities a province offers to increase the well-being and numbers of our population?

Provincialism

Provincialism becomes the champion of economic sectionalism. Each province clamors for federal support and each fails to appreciate the needs as well as the opportunities for national progress and well-being offered by sister provinces. The counsel for the Province of Nova Scotia, in his exceptionally able brief before the royal commission stated that: "... a federation is a different form from that of a unitary state. Had the provinces of British North America been welded into a legislative union, the Dominion today would constitute one political entity and the inhabitants of this section of the Dominion would have less valid grounds for complaint."

That Nova Scotia has not shared fully in the advantages of the protective policy; that its primary industries have suffered severely from it; and that partly as a direct result of this policy the provincial government finds itself deprived of sufficient revenues to carry out the functions imposed upon it by the Act of Confederation, was the conclusion not merely of the counsel, but of the royal commission. It is worth something to have this contention formulated as the judgment of the distinguished economists of the commission. Moreover, the commission agreed that federal subsidies should be distributed on a basis which should take into account the effect of the national policy, and that the federal government should take over from the provinces those functions or services which provide common standards of decent living for Canadian citizens.

Such a transfer of functions would mean an amendment of the BNA Act, an amendment greatly needed but exceedingly difficult to effect, and rendered even more difficult by rigid provincialism. However, we could accomplish it, and yet preserve inviolate the rights guaranteed by the Fathers, if we approached our problem in the same generous spirit in which they wrought out our original constitution.

But, admitting these facts, does it follow that federal policy should make its primary consideration an equality of development and prosperity in each of the provinces? The adoption of such a principle would defeat any far-sighted national policy and would increase our already

over-stimulated provincialism. Provincialism has already captured the press in some provinces and become the stock-in-trade of many provincial politicians. Yet such a policy is suicidal to national unity and development. It would rob our federal Parliament of its comprehensive and national character and turn it into a number of regional groups, and it would become very extravagant by reason of the log rolling and bargaining of these groups for their sectional interests. Our legislators would cease to have any understanding or appreciation of national ends, or to feel any deep sense of their responsibility to legislate for all of Canada; each group would be primarily concerned with its sectional interests and satisfied when they were attained. From such a Parliament it would be impossible to evolve a comprehensive and far-seeing policy for the nation's good. Sectionalism would be equally bad for the provinces. It would be a cloak to cover inefficiency and extravagance. It would put a premium upon stagnation and tradition and routine in administration, and would be a cul-de-sac to prevent any careful investigation and reasoned solution of provincial problems.

Vision of Our Forefathers

The Fathers of Confederation felt that they were establishing a Canadian Parliament and were creating out of these provinces a new nationality. They were uniting the people, and not merely provincial governments. For the great purposes assigned to the federal government, they meant it to function as if we were a legislative union. If our federal policy does not promote the general ends of our people, if it is not a policy for the common good, our Constitution provides an appeal, not to the separate provincial governments but to the sovereign power itself—the intelligence and judgment of all the citizens of Canada. If the federal policy is one for purely private and sectional interests, then let the nation pronounce judgment and assert its will. Our citizenship affords not merely full freedom of movement within the nation, but the right of appeal to the sovereign power for protection and justice. Our security and well-being are not to be attained through sectional or provincial alliances, but through the action of the intelligence and conscience of Canadian citizens.

Our great danger is in our ignorance of actual situations, in emotional complexes and prejudices that blind us, and in self-seeking which narrows the vision and directs our energies. As Edward Blake said long ago, "Until Canada develops a national way of thinking we cannot get the spirit necessary for the welfare of the nation." Our problem in Canada today is to

create in our citizens the national way of thinking. We must produce citizens throughout this wide Dominion with a clear understanding of, and a vital interest in, the aspirations and needs of their fellow citizens of every province and section, and in the resources and possibilities of every portion of Canada.

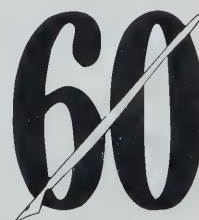
Early civilizations centre in small groups, but as they grow the groups enlarge and coalesce. Indeed, it is only as we pass from the "here" to the "there," from the "now" to the "then," only as we look before and after, only as we discern ourselves as a focus of universal relations, that we lift our lives out of illusion into reality. It is only as we grasp the essential facts and laws of existence and use them in clear, impartial thinking for comprehensive ends, that we ourselves achieve some degree of nobility and goodness and leave a worthy heritage to our children.

Diamond Jubilee of Publication

Throughout 1994, the Journal of the Canadian Dental Association celebrates 60 years of publication as the authoritative "voice" of dentistry in Canada. Each month, in commemoration of its Diamond Jubilee, the Journal will reprint an article from Vol. 1, 1935.

The writer of this month's article, W.C. Keirstead (1871-1944), may have been ahead of his time. Canada has indeed become a land of have and have-not provinces, and Parliament is clearly split along sectional lines, with the Bloc Québécois representing the interests of Quebecers (and working toward Québec sovereignty) and the Reform Party representing the interests of Western Canada. It is also clear that many of our legislators have ceased: "to have any understanding or appreciation of national ends, or to feel any deep sense of responsibility to legislate for all of Canada." We can only hope that it is not too late for Canada to heed Mr. Keirstead's (PhD) message, and "develop a national way of thinking."

Mr. Keirstead (PhD) was a professor of philosophy and education at the University of New Brunswick from 1908-1944. He was born in Cornhill, Kings' County, New Brunswick. After attending provincial normal school in Fredericton, he went on to earn both his BA (1898) and MA (1900) from the University of New Brunswick. He earned his PhD from the University of Chicago in 1899.



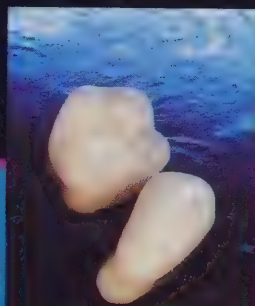
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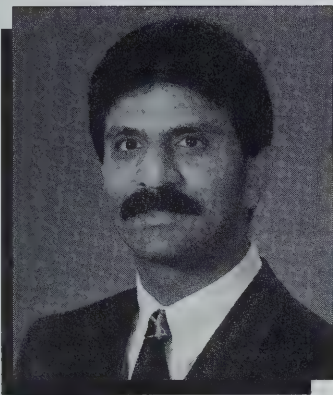
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IVOCLAR WILLIAMS



Putting Your Best Phone Forward: Effective Use of the Telephone

Imtiaz Manji, B.Sc.,
President of ExperDent

Why, you ask, would anyone dedicate an entire column to an ubiquitous piece of telecommunications equipment like the phone. For starters, consider the fact that despite its long-standing and widespread use, the phone, curiously, remains an oft misused communications tool.

You only need to make a random sample of business phone calls, on any given day, to experience the frustration that comes from dealing with an ineffectual voice on the other end of the line. (Looking for insight into how your practice handles incoming calls? Call in yourself from outside the office or have a family member or friend do so.)

The number of times that I've witnessed telephone communication go hopelessly wrong is proof positive, for me, that phone etiquette is not an innate skill but rather an acquired one. And as we'll see later, mastering this so-called elementary skill is more important than ever, both for its own sake and as a building block for handling the advanced telecommunications that are now entering homes and businesses across Canada with a vengeance.

Effective use of the phone is critical to any business, but in dentistry it is nothing short of a lifeline. Whether it's a new patient calling to schedule an appointment or a professional colleague wanting to discuss a common patient, the phone single-handedly shapes the caller's initial impressions of your practice.

Let's take the example of the potential new patient calling your practice for the first time. This individual may have chosen — as people seeking new services often do — to use the telephone to narrow down the field, and locate just the right practice to meet his or her needs. If the only exposure this person has to your practice is via the phone, surviving the process of elimination will require your staff to convey the best possible first impression during the potential patient's initial call.

Honing Those Skills

Acquiring correct telephone skills is inherently empowering. It puts you in control of the communication exchange and its successful outcome. Simply by coupling carefully selected words with a warm tone, you can engender a result just as positive as if the caller was standing in front of you.

Although the receptionist is probably the staff member answering most incoming calls, the entire dental team — including the dentist — should be privy to the practice's phone protocol and be in a position to follow it consistently. Here are a few tips that your receptionist, your other team members, and you, can use to help make a telephone call to your practice a positive experience for your potential and existing patients:

- *Adopt a positive attitude.* With the hectic pace of some practices, it's often difficult not to

view that "ring" as an interruption, particularly if there's a bottleneck of patients standing before you. But conveying a polite, enthusiastic tone for the caller — no matter what they're calling for, even if it's to cancel an appointment — is a serious opportunity to demonstrate your professionalism to both the caller and to the patients within earshot of your conversation. Remember that enthusiasm is contagious, and you want to make each and every potential patient feel that they have made a wise decision by calling your dental practice. Any frustrations and anxieties you may be experiencing on the job should be put on the back burner. When you're on the phone, you must be consistently cheerful and polite.

- *Don't make them wait.* Callers are more impatient when they're calling businesses than they are when making personal calls. If you wait too long to answer your phone, or put them on hold for any length of time when you do, they may simply hang up in frustration. The ideal time to answer a ringing telephone is between the second and third ring. Always attempt to have a backup person who keeps an ear out for that third ring and never lets the ringing go beyond that.
- *Focus yourself before you start to speak.* Take three seconds to take a breath, put on a smile, and compose your greeting.

Speak clearly so the caller can understand every word. Now you're ready to begin.

- **Start building a relationship.** No matter who answers the phone in your office, the conversation should begin with words something like, "Good morning, Dr. Smith's office, this is Janet," to let patients know they have reached the correct number and that there is an identifiable voice at the other end of the line. (Make sure not to bury the name of the person answering the phone somewhere in the middle of your practice greeting. Instead, make it the last thing the caller hears.)
- **Be well informed about practice services and policies.** To help the administrative team address the concerns of patients in a positive manner, the dentist should outline the practice's guidelines with respect to payment options (including whether or not you accept assignment), appointment policies, quoting fees over the phone, sterilization protocol, and new patient procedures. For best results, ensure that the staff member responsible for these areas of your practice has enough authority to ensure that your guidelines are consistently observed. (If the question posed by a patient is outside the authority or knowledge base of the staff member answering a call, the patient should be told politely by the staff member that he or she will consult with the appropriate party and then get back to the patient with an answer. The patient will get the impression that his or her question will be answered correctly, based on a complete understanding of the situation. And the staff member will have handled the entire affair with poise and professionalism, without losing credibility.

Particularly when it comes to specialty treatments, ensure that the reception team knows enough about what goes on in the dental chair to market these services well. It is particularly frustrating for staff and patients

alike when what seems to be a simple question cannot be answered without asking someone else, placing the patient on hold, or even having to call back later with the information.



- **Take messages and give information with polish.** Have a clear understanding with the dental team regarding personal calls, and determine the calls they must take, be they from a baby sitter, a child or a teacher, etc. Anyone not on this exclusive list who calls during working hours should be handled by offering an alternative. The staff member answering the phone can either take a message, or suggest that the person could try calling back during a break, during lunch, or after work. (If you have eight to 10 staff members, each of whom receive personal calls, you already know that this can be very tough on the receptionist and disruptive to the practice.)

The correct way to ask for the caller's identity is, "May I say who is calling?" That way, if the call is of a personal nature, and the caller wishes to remain anonymous, you can suggest a suitable time to return the call.

If a patient is calling to speak with a member of your team, you might say, "I'm sorry, Mary is with a patient. May I take a message, or is there something I can help you with?" This is another example of the more-

than-they-expected service that is easy to provide.

- **Watch that hold button.** When it's necessary to put someone on hold, be sure to ask if the person minds waiting and to indicate how long you intend to be gone. An example would be, "Mr. Jones, I will need your chart before I can answer your question. It will take about two minutes. Can you wait, or shall I call you back?" Mr. Jones will likely agree to wait, and you would reply, "Thanks, please hold."

When you return with your answer, it helps to re-orient the patient and let him or her know you are back on the line. Start your conversation with, "Mr. Jones, thank you for holding."

If you are faced with someone at the desk when the phone rings, it is often better to call the patient on the phone back if their question isn't brief. The last thing you want to do is hurry the patient in front of you and leave the caller on endless hold. This is a recipe for making both people unhappy. The key here is to be polished and gracious. Maintaining an easy, friendly manner in handling these types of calls will go a long way toward making both the patient with you and the patient on the phone feel comfortable.

The rules for telephone communication in dentistry are really no different than they are in other businesses. But in dentistry, where the handling of a single phone call from a new patient (or an existing one) may make or break your positive image, you need to be diligent about viewing — and using — the phone as the lifeline communications tool it is.



Telecommunications '90s Style

A '90s spin on phone communication must be factored into any telecommunications equation. Mastering the traditional phone exchange between a caller and a recipient is still fundamental, but it's not enough. We now have to be aware of how advances in telecommunications impact our ability to communicate with others.

The proliferation of answering machines, cellular phones, voice mail, fax and modem are but some of the virtual bevy of telecommunications options. Yet interestingly, there are still cases where, "No one's home." (I'm sure I'm not the only one who ends up talking to friends' answering machines for months on end before getting them "live.") We're seemingly more accessible, yet less in touch than ever; in the global village. Communication often occurs one-way through a caller leaving an electronic message and the recipient returning the call by leaving another electronic message. The implications of two parties communicating

without ever having spoken to each other are far-reaching.

Although dental practices still have "live" receptionists for the most part, they are dabbling to a certain degree in electronic data exchange. These tools, like the phone, can be used powerfully or disastrously.

The practice that uses an answering machine when it's closed, indicating practice hours, instructions on who to contact in a dental emergency, and when the office will reopen, demonstrates enhanced concern for its patients. (If you leave a pager number on the machine, make sure you can be paged!)

Contrast this with the practice that puts on an answering machine during traditional business hours, and provides callers with no message at all, other than: "You've reached...Please leave a message at the sound of the tone." It can be particularly irritating for a patient to be left without any details as to where the team is and when they'll be back.

If you're in the habit of putting on your answering machine (or using an answering service) when you break for lunch, a meeting, or

continuing education, don't keep patients in the dark. Keep them informed so they don't waste time trying to figure out when to call back to get a "live" dental team member, or when their message is likely to be returned.

Voice mail, although widespread in many businesses, is still relatively foreign to dentistry. However, there are some practices using this service to great effect. Patients call in and can press various numbers to get or leave specific information. For example, patients might press: "One, to leave a personalized message for the dentist or one of the staff; two, for instructions on how to deal with a dental emergency; three, for information regarding your upcoming appointment; or, four, to leave a message for the administrative team."

As telecommunications advance, dentistry should certainly take advantage of these new tools. But keep in mind that they are really just value-added props that enhance the practice "stage," and certainly not a substitute for the actors. ■



In Communiqué This Month...

- **CDA Board to Formalize New Policy On Insurance**
- **Amalgam Debate Enters California Courtroom**
- **Study Suggests New Benefit of Fluoridation**
- **Link Demonstrated Between Oral Health and Insurance Coverage**

News

- **CDA and CIDA Team Up to Improve Dental Health In Africa**
- **CDA Supports Plain Packaging of Tobacco Products**
- **New DIS Pamphlets Now Available**

Special Features

- **Meet Mr. Taxation Dr. Robert Hicks**
- **Tax Shelter Mania**
- **A South African Dentist Makes a New Start In Canada**

... And More

Look for these stories and more in the April issue of Communiqué. CDA members receive Communiqué six times per year in the language of their choice as a benefit of membership in CDA. To join Your National Association, call 1-800-267-6354.

JOURNAL

April/
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Vol. 60
No. 4

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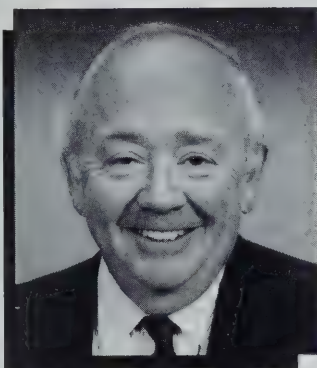
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Dr. Rod Moran, President of CDSPI

CDSPI takes requests. Just like the lounge pianist who takes requests from the audience, and then plays the songs patrons want to hear, we're always listening to dentists and acting on their wishes.

In fact, Canadian Dental Service Plans Inc.'s (CDSPI) staff and executives are well positioned to listen to what dentists want in their financial programs, and to respond to their requests. We're closely involved with dentists across Canada each and every day — some of us are dentists ourselves.

For example, many of you have asked us to add a higher risk investment fund, with a corresponding potential for higher returns, to the CDA RSP. So we researched the financial marketplace, analyzed and compared fund managers, and then selected Altamira Management Ltd. to manage a new higher-risk fund — the CDA RSP Aggressive Equity Fund.

Altamira is an investment industry leader — many financial experts say *the* industry leader. The company has 25 years of investment experience and currently manages over \$11 billion of pension and mutual fund accounts.

The CDA RSP Aggressive Equity Fund

Unless you're one of the dentists who requested this fund, you may be wondering exactly what it is, and just what an aggressive fund is doing in a retirement savings plan geared toward security of funds.

An aggressive fund — also called a special growth fund — specializes in shares of small emerging companies, in promising areas of business, which have a strong potential for significant growth. Investments in the CDA RSP Aggressive Equity Fund will be broadly diversified among Canadian companies, and actively managed with an aggressive trading style.

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Now, why does a higher risk fund belong in an RRSP? Consider it in the context of CDSPI's Decades

in Dentistry program. Under this program, CDSPI examines how dentists' financial needs change during each stage of their life and career, and then provides products and information geared to each stage. The Aggressive Equity Fund especially meets the needs of dentists in their younger years. In this scenario, the fund — as one part of an investment mix — provides dentists with the opportunity for exceptional returns over the long term. However, it can also be well suited to dentists in their middle years, depending on their individual risk tolerance. This fund is not for everybody, but it can be an important component in the RRSP investment mix for many dentists with high risk tolerance.

A New Investment Team

The CDA RSP Aggressive Equity Fund was born in March, at the same time as two other important developments took effect. Altamira Management Ltd. became the manager of the CDA RSP Common Stock Fund, within more conservative investment guidelines, and the management responsibility for the CDA RSP Balanced Fund was awarded to Knight, Bain, Seath & Holbrook Capital Management. The CDA RSP Bond and Mortgage Fund and the CDA RSP Money Market Fund will continue to be managed by Canagex Associates.

Knight, Bain, Seath & Holbrook is one of Canada's leading balanced fund managers. The firm has over \$4 billion of assets under its

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management, and has delivered returns well above the industry average for more than a decade. I know you prefer seeing actual numbers, so I'll tell you that the annual compounded total returns for the company's Pooled Balanced Fund have been 18.7 per cent over the past three years and 28.5 per cent over the past year (ending December 31, 1993). Again, these figures show past performance only, and may not reflect the future results of the CDA RSP Balanced Fund.

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I know I mentioned piano playing before, but with our addition of Altamira, and Knight, Bain, Seath & Holbrook, perhaps a drum roll followed by a fanfare would be in order. Bringing these fund managers into our fold truly is a dramatic development for the CDA RSP program.

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Common Stock Fund	23.59804	24.23886	26.36%
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April/
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1994
Vol. 60
No. 4

CLINICAL



Access and the Cementation of Indirect Restorations: A Case Report

William H. Liebenberg, B.Sc., BDS (Rand)

ABSTRACT

Through the pictorial presentation of a case study, this paper examines the role of rubber dam isolation in accommodating and maintaining the exacting access requirements of cementing indirect restorations. Technical tips to optimise the stability of the rubber dam for the duration of the procedure are introduced.

Most educators will concede that cotton-roll-assisted isolation provides compromised but satisfactory access when dealing with non-resin cements. However, the relatively insoluble resin cements demand a more assiduous cementation procedure. The use of a customised matrix is offered as an example of the exacting demands of resin cementation, thus highlighting the distinction between the access requirements of traditional cementation as opposed to bonded restorations.

SOMMAIRE

À l'aide d'illustrations, cet article examine le rôle de la digue en caoutchouc pour maintenir et favoriser l'accès toujours étroit aux parties qui font l'objet d'une cimentation indirecte. On y donne des conseils techniques pour en améliorer la stabilité durant l'exécution de la procédure.

La plupart des enseignants admettent que l'isolement à l'aide de rouleaux de coton offre un accès compromis mais satisfaisant lorsqu'il s'agit de ciments sans

résine. Cependant, étant insolubles, les ciments à base de résine demandent une plus grande attention lors de la cimentation. L'utilisation d'une matrice faite sur mesure fait voir les grandes exigences d'une cimentation avec un ciment à base de résine, faisant ressortir la différence entre les exigences d'accès pour une cimentation traditionnelle et celles des restaurations à l'aide d'adhésifs.

Introduction

The objective of attaining proper access in operative dentistry is to gain a complete and unobstructed approach to the working field, allowing for precise execution of the various procedural manipulations involved in the delivery of the restorative option. Rubber dam, although not used in every dental practice, is nonetheless universally accepted as the standard device for isolation of the working field. Its usage has become synonymous with moisture control and the concept of asepsis.

Despite the technique's universal acceptance, one benefit of rubber dam isolation — the access that accompanies the isolation effort — is largely ignored.¹ The access provided by a well-planned and properly-executed rubber dam application has no substitute. It is submitted, here, that the proficiency of its application makes rubber dam an absolute "must" for

both routine and complex operative procedures.

The oversimplification of equating adequate access with mirror-handled cheek retraction and cotton-roll-assisted soft tissue displacement has led to the unfortunate disenchantment and ultimate rejection of many valuable restorative options. It is the author's view that inadequate access is the most common prelude to the failure of many complex operative dental procedures, and is probably the most frequently underemphasised aspect of operative dentistry.

The purpose of this article is to relate, through a pictorial presentation of a case report, some general concepts concerning the attainment and advantages of sound access. The concept of adequate access is applied to the cementation stage of a complex indirect restorative option in the lower arch.

Case Description

The patient was rendered edentulous in the molar region of the upper quadrant 15 years previously. A partial denture was constructed but never used. This resulted in an over-eruption of the lower molars. The inter-arch distance was further compromised by a compensatory growth of the mandibular alveolus and drifting of the molars into the extraction site in the fourth quadrant. A maxillary removable prosthesis was prescribed along with a lower rehabilitation using a combination of im-

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Fig. 1: Traditional cements in fixed prosthodontics are readily dissolved and rarely lead to plaque catchment sites. Traditional methods used in removing the luting cement excess following cementation, as depicted in the lower left quadrant, include: a) the hardened buccal and lingual cement excess is displaced using an explorer; b) the spongy portion of a length of superfloss (Oral B) is laid in the interproximal area while the cement is still soft. Once the cement has fully hardened the floss is pulled free. In most cases, this removes the interproximal debris en masse; c) knotted floss is used to remove cement residues and then flushed with water.



Fig. 3: Intraoral view of restorative site in the mandibular right quadrant at cementation. Primary rubber dam retention is provided distally by a metal clamp on the last molar and mesially by an interproximal orthodontic separating module on the contralateral non-anesthetized side. In addition to the retractor on the canine, further rubber dam stability is provided by a second molar clamp on the first molar and the placement of "anterior-sized" anchorings around the shouldered margins of the implant-supported abutments.



Fig. 2: Intraoral view of the 4th quadrant following aggressive clinical crown reduction in an effort to restore the interarch space. Osseous reduction was of limited value due to the proximity of the molar bifurcations. Bonded porcelain onlays were considered the most conservative post reduction restoration.



Fig. 4: The reward of adequate isolation. After washing and drying, the etched enamel surface presents a characteristic frosty surface that optimizes the bonding process. Note how glass-ionomer protective bases were placed over the exposed dentin following residual caries removal.

plant- and tooth-supported restorations.

Surgical clinical crown lengthening provided sufficient inter-arch clearance in the third quadrant to permit full coverage restoration. Osseous reduction was of limited value in the fourth quadrant due to the proximity and configuration of the root bifurcations. The inter-arch space increase was therefore dependent on aggressive clinical crown reduction. Bonded porcelain onlays were considered the most conservative post-reduction restoration.² Two SDI Integral implants (Calcitek Inc.) were placed mesial to the molars in anticipation of an implant-supported fixed prosthesis. The canine was restored

with a porcelain laminate as part of the interarch occlusal therapy.

Isolation Requirements

Most clinicians are versed in applying rubber dam clamps to "retain" the dam peripheral to the working field. This "primary" rubber dam retention, in many instances, provides adequate operator access. Additional rubber dam manipulations within the operator field are occasionally needed with the more detailed procedures in our restorative repertoire. A reflection of the access considerations involved in affecting interproximal restorative excellence in this case report will punctuate the need for uncompromised isolation.

Third Quadrant-Traditional Cementation

The traditional cements used in fixed prosthodontics are readily dissolved in the oral environment^{3,4} and very rarely lead to plaque catchment sites. **Fig. 1** details the three traditional methods used to remove excess luting cement following cementation in the lower left quadrant. The cementation clean-up procedure used in the third quadrant is detailed in the accompanying legend to highlight the considerable difference in cementation effort between the two quadrants. Rubber dam application, although traditionally advocated for moisture control and patient protection during crown



Fig. 5: Buccal view demonstrates the caulking effort that stabilizes the "Modified Gingival Retractor."⁶ This is a single "jaw" retainer, as the lingual beak of a traditionally modified 212 retainer has been further modified by sectioning with a fissure bur. The sole purpose of applying the retractor to the canine is to maintain the dam gingival to the preparation margin of the veneer. The porcelain veneer is placed in position on the canine, rolling it about the incisal edge toward the gingival margin. This action allows the excess adhesive material to extrude from the peripheral aspects of the veneer. The veneer is then tacked into position with a 10-second light exposure, directed onto the central aspect of the facial surface. The uncompromised access provided by the isolation strategy permits meticulous removal of the excess resin as described by Tay.¹⁷ A fine brush moistened with unfilled resin is used to wipe away the excess and seal the exposed resin.

Rubber-dam assisted isolation ensures that the chairside assistant is not preoccupied with the provision of access (i.e. cheek and tongue retraction) and is able to provide an "increase" in the working time of the visible-light-cured adhesive by shielding the working field from the additional curing effect of the overhead light. The shield is held directly in the path of illumination of the overhead light. Although the curing wavelengths of the overhead light source have been filtered, there is still sufficient illumination of the working area to permit the meticulous removal of excess adhesive prior to final curing. Orange hand-held shields are recommended during the curing procedure as the filter protects the clinician, assistant and patient from the potentially harmful wavelengths of light. Satrom et al demonstrated that retinal damage could occur after only 2.4 minutes of daily exposure to light in the blue range with some curing units.¹⁸

cementation, is dispensed with by most clinicians in favor of cotton roll isolation. While it is accepted that all luting agents are affected by moisture,⁵ most educators concede that the isolation obtained with cotton rolls, albeit compromised, does provide sufficient access when dealing with non-resin cements. However, the relatively insoluble resin cements demand a more assiduous cementation process. Cotton-roll-assisted isolation is decidedly inappropriate when using resin luting cements.

Fourth Quadrant-Resin Cementation and Placement of Tissue Integrated Prostheses

Primary rubber dam retention is

provided distally by a metal clamp on the last molar and mesially by an interproximally-wedged orthodontic elastomeric separating module on the contralateral non-anesthetized side (**Fig. 3**). Additional rubber dam stability, which is essential for adequate access during the placement of this complex restorative option, is provided by:

1. The placement of a "modified gingival retractor" to the canine.
2. A second molar clamp, which serves to complete the isolation of the molars.
3. The placement of orthodontic elastic separating modules around the shouldered margins of the implant supported abutments.

Modified Gingival Retractor

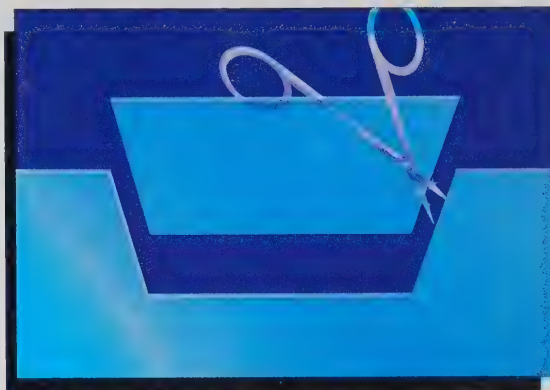


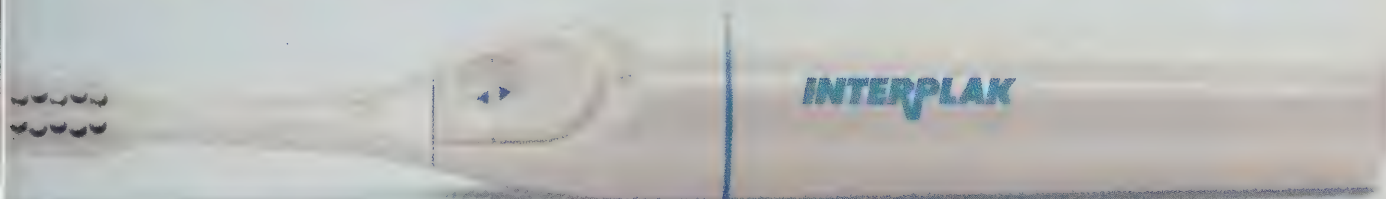
Fig. 6: Using the die as reference, a trapezoid-shaped trough is customized from a length of clear mylar band.¹⁹ The customised matrix serves to confine the gingival margin and thus limits the cement overflow to accessible areas. It can then be removed with a fine sable brush moistened with bonding (un-filled) resin.



Fig. 7: Diagrammatic representation of a customised modified matrix. The matrix "isthmus" should be wide enough to cover the gingival margin and yet still lie within the superior confines of the gingival embrasure. It is imperative that the matrix does not extend into the contact zone of the restoration. The restoration will not seat if the matrix "isthmus" is interposed between the contact points of the restorations.

It was anticipated that the uneven recession of the buccal and lingual gingival tissues would result in gingival trauma during clamp application to the canine in preparation for laminate bonding. The modified gingival retractor⁶ is the ideal means of stabilizing the dam gingival to the canine. The lingual beak of a traditionally-modified 212 retainer is sectioned with a fissure bur, then the remaining buccal beak is bent rootwards and gently applied to the buccal surface gingival to the veneer chamfer margin. This margin is exposed with selective digital pressure on the buccal dam curtain. It is important to note that the preparation margin is supragingival and further exposed with retraction-cord-aided retraction prior to the

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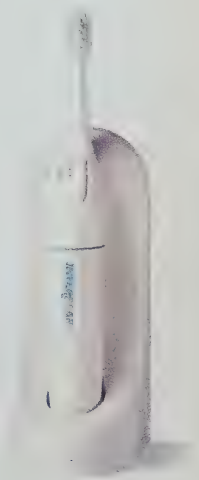
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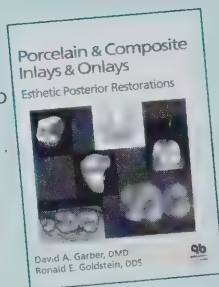


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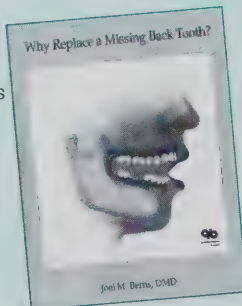
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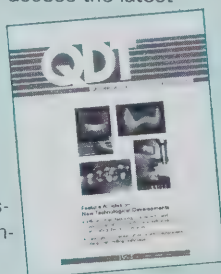


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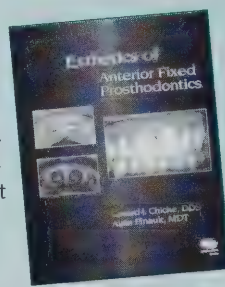


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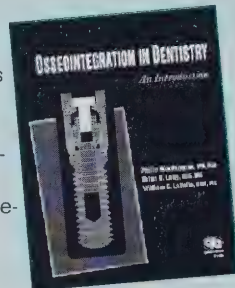


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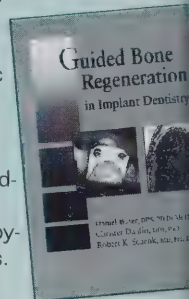
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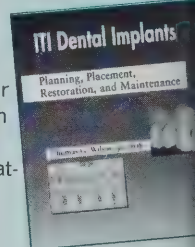


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isolation effort. The sole purpose of applying the retractor to the canine is to maintain the dam gingival to the preparation margin of the veneer, thereby providing uncompromised and hands-free access to the delicate chamfer margin of the laminate preparation. This position is then stabilized by the operator as the chairside assistant applies an abundance of caulking compound to the isolated bow/incisor complex. The bow of the retainer can interfere with the accurate moulding of the compound to the underlying tooth. A predictable and durable caulking splint is achieved through the use of a "compound applicator."⁷ This is a stick of thermoplastic caulking compound (Kerr), which is placed in the lumen of a disposable plastic syringe and thoroughly softened in a tumbler of hot water. A three-minute immersion generally produces a consistency that is easily extruded and readily manipulated with wet fingers, once placed. Note how the compound is first directed below the bow to fully engage the undercut of the incisors, and then allowed to flow over the clamp prior to being moulded and firmly pressed into position with warm wet fingers. The compound is then flooded with water to hasten hardening. The advantage of using a compound applicator is that durable clamp stability is achieved with each and every application, with access being maintained for the entire length of the procedure.

Second Molar Clamp Application

Each application of rubber dam presents its own unique challenges. For example, the projecting wings occasionally present a hurdle when applying clamps side by side. The wings are intended to restrict the rubber dam from the field of vision, and can be cut off with a fissure bur if troublesome.⁸ Wingless clamps, although available, can in many cases compromise overall access to the working field. An alternative solution is depicted in **Fig. 7**, where the wings of the retaining clamps are interdigitated as a result of the variation in the gingival purchase points on the molars. Application of the mesial

clamp necessitates an angular approach, as the lingual wing of the distal clamp is bypassed. An evaluation of the primary fit of the por-

celain onlays prior to the definitive bonding procedure is facilitated by the unhindered circumferential access permitted by this retainer ar-



Fig. 8: Light-activated resin cements with dual chemical-cure components are now routinely used to ensure uniform bonding, even in deep interproximal preparations.^{20,21} However, the interproximal "clean-up" procedure requires an assiduous approach. The distal restoration is bonded and excess luting cement is removed in the usual manner. Access to the distal interproximal margin of the first molar is restricted by the restoration itself. Note the customised mylar strip positioned in anticipation of compression insertion of the resin-coated porcelain restoration.



Fig. 9: A length of superfloss (Oral B) is threaded through the holes of the clamp prior to placement of the restoration to effect maximum contact with the interproximal margin on withdrawal. The restoration is tacked into position with a mesio-occlusally directed exposure of visible light. A fine brush is used to "load" the spongy portion of the superfloss with unfilled resin prior to its interproximal passage.¹⁹ This technique ensures that the excess adhesive is wiped away and it also serves to seal the exposed resin.

Using a beaver-tailed burnisher, the ends of the interproximal floating customized mylar strip are gently moulded to the facial and lingual surfaces of the molar and cured with interproximal light applications. It is the intimate interproximal matrix adaptation that ensures margin perfection. Perfection, as always, is the ultimate goal. However, every practising clinician knows that this is not always, if ever, achieved. Each clinician must determine for him or herself how much less than total perfection is acceptable for a restorative option. The criteria for "acceptability" will fluctuate as a function of many factors. It is therefore incumbent on each clinician to ensure that the range of the treatment repertoire expands at the same rate as the demands of the procedure.

range. Thorough marginal integrity is furthermore guaranteed as the access permits meticulous control with interproximal finishing.

Anchoring Assisted Access To Implant Abutments

The value of patient protection afforded by rubber dam isolation is realized during the attachment phase of the implant-supported prosthesis with the use of orthodontic elastic separating modules.⁹ These are "opened" with the aid of two pieces of floss, and then eased around the shouldered margins of the implant abutments. Care must be taken not to exceed the elastic limit of these modules, as their circumferential retentiveness will be diminished and so disturb the access. Once the bonding and interproximal finishing of the molar onlays has been completed, the retainer on the first molar is removed to allow for attachment of the implant-supported prosthesis. The transfer and placement of the coronal screws is done in a relaxed and unhurried manner, as the clinician takes comfort in the knowledge that the patient is fully protected, with no possibility of swallowing or aspirating a prosthetic component.

Access the Key To Success In Complex Restorative Procedures

Figs. 2 to 10 depict some of the general concepts with respect to the attainment and advantages of sound access in the lower right quadrant. The increased physical strength of ceramic materials, and the results of studies indicating that the wear resistance of ceramics is in the range of enamel,¹⁰ make it feasible to use these materials in the posterior part of the mouth with some degree of certainty that they will survive the destructive forces of occlusion. There has been a tendency for clinicians to assume that the recognized rules and principles of precision prosthodontics are no longer applicable to the technique of the resin-bonded posterior ceramic restoration. This is due, in part, to the immediate esthetic result, which is relatively easily and consistently attained irrespective of the "primary" accuracy of the mar-



Fig. 10: Precise loading of the adhesive, the unfilled resin moistened superfloss and the trough-shaped interproximal matrix all serve to prevent the excess adhesive from flowing across the interproximal area and bonding to the adjacent tooth. Uncompromised access has thus facilitated the provision of thorough interproximal marginal integrity, as depicted in this occlusal view of the bonded overlays prior to interproximal polishing with resin finishing strips. Bonding complete, the retainer on the first molar is removed to allow for attachment of the implant supported prosthesis. The transfer and placement of the coronal screws is done in a relaxed and unhurried manner, as the clinician takes comfort in the knowledge that the patient is fully protected with the rubber dam, with no possibility of swallowing or aspirating a prosthetic component. Once the restorative attachments have been completed, the rubber dam is removed by applying digital tension to the buccal curtain, exposing the interdental dam strips which are then sectioned with a pair of scissors. The elastic modules are removed with the aid of a probe and fine-beaked artery forceps. Fine adjustments to the occlusion are then completed once the rubber dam has been removed.

ginal fit. In fact, these restorations are esthetic to the point of being virtually indistinguishable from natural teeth,^{11,12} and exhibit good color stability and stain resistance. It is understandable, given the esthetic consistency, that many general practitioners accept the primary (before bonding) marginal accuracy as "secondary" to the overall treatment objective. The assumption that the resin excess will fill-in the marginal imprecisions is mere conjecture, however, as research has authenticated the essential role of precision in the primary fit of the porcelain restoration in the longevity of this treatment option.^{13,14}

The objective of using resin-bonded cement is to intimately attach porcelain restorations to enamel and dentin, and to create a bond that is both stable and durable. However, I believe that the relative insolubility of resin cement in oral fluids explains why inadequately-finished interproximal margins are the most significant problem in this extremely exacting

and technique-sensitive restorative procedure. The porcelain-bonded restoration provides one of the greatest challenges to the clinician, as the excess resin cement is squeezed out from under the margins as the restoration is applied to the tooth. All advocated methods of removing this excess rely on visual access.

The application of a "customised matrix," as depicted in Figs. 4 to 7, has been included in this report to illustrate the exacting procedural demands of resin cementation versus the less technique-sensitive requirements of traditional cementation.

In a class-two cast-gold restoration, resistance to complete seating invariably signifies a proximal contact discrepancy. Since the casting is adjusted on a model, the contact is usually found to be within a very close tolerance on the plus side. The restoration is then either compressed into place during cementation, or adjusted using paper discs on the "marked" interference. This doesn't occur with ceramic resto-



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rations, however, as they are exceptionally fragile in the unbonded state. Proximal adjustments to the glazed porcelain surface are often a time consuming and potentially hazardous procedure, which is one of the major reasons for ensuring adequate access at the start of the procedure. The delivery of the resin-bonded posterior porcelain restoration relies on meticulous attention to detail in all components of the operative procedure, optimised by uncompromised access to the working field. The problem of interproximal control is compounded when both mesial and distal surfaces are involved, as in this case report.

The completed restorations need to be tried-in to check for the primary accuracy of fit. Minor occlusal discrepancy suggests resistance to complete seating, which is decidedly unacceptable, as degeneration wear of marginal cement occurs in direct relation to the inadequacy of fit in resin-bonded porcelain restorations. Floss is used to check the intensity of the contact. If improper resistance is encountered, then the floss is colored with articulating paper and carefully passed through the interproximal contact to mark the proximal interference. Fit-checking mediums (Fitchchecker, G.C.) can also be used as an indicator that internal adjustments are needed to improve the seating of ceramic inlays. Clinicians are, however, encouraged to monitor the progress of recent research indicating that the use of a silicone fitting-paste imparts a film on the etched porcelain surface, resulting in a markedly reduced bond strength of composite resin to porcelain.^{15,16}

The best means of protecting the approximal surfaces from excess resin attachment is to place a mylar strip in the interproximal space, thereby limiting the overflow of luting resin in that area. The mylar strip serves as a matrix, as it fences off the inaccessible interproximal gingival margin. However, this matrix assemblage precludes full seating of the ceramic restoration due to the thickness of its substance. Compensatory space, which is generated by distending the interproximal space with wedging, is

often a hit and miss process — with dire consequences once the contact of a bonded restoration is found to be wanting. If wooden wedges are needed they will require some manipulation, either through reshaping or redirection. The preparation surfaces are then treated according to the protocol of the chosen resin bonding agent. The use of a customized mylar strip, as depicted in this case report, is an innovative method of minimizing interproximal luting (composite) excess. However, its use is restricted to areas of uncompromised access and true four-handed dentistry. Cotton-roll-assisted isolation invariably reduces four-handed dentistry to two-handed isolation and two-handed operation.

Conclusion

A case has been presented in which the provision of adequate access played an important role in allowing for the meticulous placement of lower posterior restorations. A distinction was made between the access requirements of traditional cementation of indirect restorations as opposed to bonded restorations. The bulk of the rubber dam effort was directed at the exacting requirements of resin cementation. Although not complete, the protocol of resin cementation has been repeated here to draw the reader's attention to the fact that it is a highly complex and technique-sensitive procedure — the success of which is optimized by adequate access. ■

Acknowledgements: I would like to acknowledge the chairside assistance of Ms. Kerry Cheyney and Ms. Daphne Roberts in the operator procedures depicted in this article.

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CLINICAL



Direct Metal Restorations

Peter Williams, DDS, B.A.Sc. MS



Dr. Peter Williams

Dentistry is an exciting profession that is always full of surprises. I expect that this is one of the major reasons why it is such a rewarding career to those of us fortunate enough to be a part of it.

Take dental materials, for example. Just when rapid improvements in competing materials were leading us to believe that dental amalgam and other direct metal restorations might be fading into oblivion, several new developments occurred to suggest that this proven technique may be with us for years to come.

As we all know only too well, the mercury content of dental amalgam has drawn the attention of both anti-amalgamists and environmentalists. Although all the scientific evidence to date indicates that properly manipulated dental amalgam poses no threat to either patient or dental staff, the legacy of controversy and doubt created by the anti-amalgamists remains. On the other side of the coin, however, the environmental concerns associated with mercury-containing discharges from the dental office will likely lead to government regulations requiring dentists to install costly metal recovery units in their office waste lines. Both of these issues are likely to encourage the elimination of mercury-containing materials from clinical practice.

Wouldn't it be nice, then, if someone could create a restorative material with the same handling and performance characteristics as amalgam, but without the environmental risks associated with mercury? In fact, one such material is already available and another one is in development. Since both of them require techniques and instrumentation that are very similar to those used to place dental amalgam, dentists will likely find it quite easy to incorporate the new materials into their armamentarium.

The first material is very similar to standard dental amalgam, except that the mercury component has been replaced by a liquid alloy composed of gallium, indium and tin. In practice, the liquid alloy and

silver powder are triturated like the mercury and silver in standard amalgam, and the resulting plastic mix is condensed, carved and finished using similar instruments and techniques. As is the case with dental amalgam, the material sets due to the silver powder dissolving into the liquid metal alloy. When the solubility limit is reached, new solid phases precipitate out to form a metal matrix, bonding together any unreacted powder particles.

Historically,¹ the gallium, indium, tin alloys were first developed as a replacement for dental amalgam in the 1920s. They were further developed by the National Bureau of Standards in Washington, D.C. and others during the 1950s and '60s. Although laboratory and clinical trials were promising, further development work was stopped when restorations made from the new alloy demonstrated excessive corrosion. Japanese researchers continued to research these alloys,^{2,3} however. The results of their laboratory tests and clinical trials, conducted during the late 1980s, indicated that these alloys have handling characteristics similar to those of dental amalgam, superior mechanical properties, and a setting rate that is fast enough to allow finishing at the same appointment.

Recently, a material based on these alloys was made available to the dental profession (Gallium Alloy GF by Tokuriki Honten, Japan).

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Unfortunately, independent studies published in 1993 suggest that the corrosion rate⁴ of these materials is too high, making them unsatisfactory for general clinical use. In addition, the incidence of tooth sensitivity with these materials was 66 per cent, compared to a 29 per cent incidence of sensitivity in teeth restored with a popular high-copper amalgam.

A second company, Southern Dental Industries of Australia, is also working on an alloy based on this chemistry. We will watch with interest to see how well this material performs in clinical trials, especially with regards to corrosion.

The other contender as a replacement for mercury-containing amalgam is also based on an alloy powder that is similar in composition to today's modern amalgam alloys. But although the material is condensed into the cavity using techniques and instruments similar to those used to place dental amalgam, at first glance it may seem very foreign to most dentists, as it is the dry powder, and not a plastic mix of powder and liquid, that is condensed into the cavity.

However, a bit of reflection about the materials we use in dentistry reveals that the concept of creating solid structures from powders is very familiar to dentists. Most ceramic restorations are made in this way, and many of the concepts that allow solid particles to bond together at room temperatures below their fusion point are also used in gold foil restorations, which are fabricated by packing together small pieces of very thin gold foil.

Since the new alloy is still undergoing rapid development at the Paffenbarger Dental Research Centre in Washington, D.C., and patents are still pending, very little direct information is available.^{5,6} Based on our knowledge of dental metals and powder metallurgy,⁷ we can speculate as to the probable mechanisms operating in this novel alloy, however.

Theoretically, metals should spontaneously fuse together if their surfaces are chemically clean and they are brought into contact. Practically, however, most metals react

with substances in the environment to form surface oxides or other surface compounds, and therefore have chemically dirty and non-reactive surfaces. In addition, unless the metal is very ductile and can be squashed down with sufficient force to squeeze out all the porosity, contact between particles will occur at relatively few places, and the final restoration will contain a very high level of porosity.

The metal powder of these new alloys is known to have a composition very similar to that of dental amalgam's silver-tin (gamma) phase. In order to make the surface of the powder particles highly reactive, they are coated with a thin layer of pure metal such as silver or gold. These coated particles are packaged in a special biologically-safe reducing acid solution to maintain the reactive surface. During condensation, the liquid is squeezed out and wiped away. On contact, the metal particles fuse together in a manner similar to the process that occurs when gold foil is condensed.

Under normal circumstances, a high level of porosity is to be expected when metal powders possessing a sufficiently high yield strength to resist plastic deformation under light condensation forces are sintered together at room temperature. It therefore seems likely that this new alloy is formulated to have a very high diffusion rate at room temperature, when immersed in the packaging solution, and to have a very small and distributed particle size. The small distributed particle size results in the individual porosities being very small, which in turn means that the distance metal atoms must diffuse to remove the porosities is very short. In addition, since the small particle size results in a relatively very large surface of chemically-active metal, and thus a high surface energy, the driving force for the particles to sinter together and remove the porosity is large. This, coupled with the metal's ultra-high diffusion rate, results in a powder that, once compacted, rapidly sinters together at room temperature to form a monolithic structure with low porosity.

Once they're condensed, these materials are essentially set and can't be carved like an amalgam. Since they must be contoured using finishing burs, the time to place them, as well as their overall cost, may be greater than for mercury amalgam restorations.

Currently, the material's biocompatibility, mechanical properties and longevity are being evaluated to determine whether it meets the criteria for use as a restorative material. Once the material meets these criteria, application for approval from the U.S. Food and Drug Administration (FDA) will be sought. Shortly thereafter, another interesting and potentially very useful material will be at the dentist's condenser tips. ■

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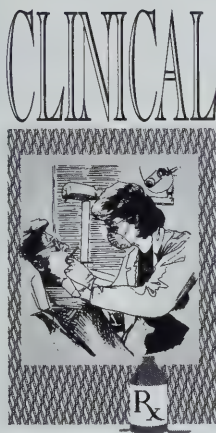
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Esthetic Conservative Incisal Restoration of Anterior Teeth — Part I

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The conservative restoration of incisally-involved maxillary or mandibular anterior teeth is often an exceedingly demanding procedure, since the primary requisites for the restorative material of choice involve a combination of esthetic acceptability, resistance to fracture and abrasive wear, and long-term durability. Full-coverage restorations, in the form of a porcelain jacket or porcelain fused to metal crowns, are options that should be carefully considered, as they virtually guarantee esthetic acceptability and resistance to fracture and abrasive wear. However, full-coverage restorations not only necessitate the removal of inordinate amounts of sound tooth structure, but are also both time consuming and expensive. Furthermore, they are contra-

indicated in the adolescent or early-adult dentition, because the pulp chambers of this population are usually large and, accordingly, the pulp response to the combined irritants of trauma and extensive preparation is at best unpredictable. Since young anterior teeth have not reached the state of full eruption, the gingival response to the placement of full-crown margins beneath the free gingival crest is often less than positive.¹

Alternatively, composite restorations should be seriously considered, since they provide excellent esthetics, fracture and wear resistance, and durability, particularly with the new hybrid-type composite materials that are currently available.² Materials such as Prisma TPH (Caulk-Dentsply), Herculite XRV (Kerr-Sybron), Bisfil M

(Bisco Inc.), Z-100 (3M Dental Products Div.), Charisma (Kulzer) and Heliomolar (Vivadent) may be used with confidence for incisal restorations. Since 24.5 per cent of the young North American population currently demonstrate incisal fractures,³ there is a highly significant need and demand for such restorations in general practise.

An extensively fractured maxillary right central incisor crown is shown in **Fig. 1**. The hybrid composite restorative technique is as follows:

1. Shade selection should be carried out before isolation.
2. A bullet-nosed diamond (RCBIK Brasseller) should be used to prepare a chamfer labially and lingually followed by the use of a very thin tapering diamond (201.3F

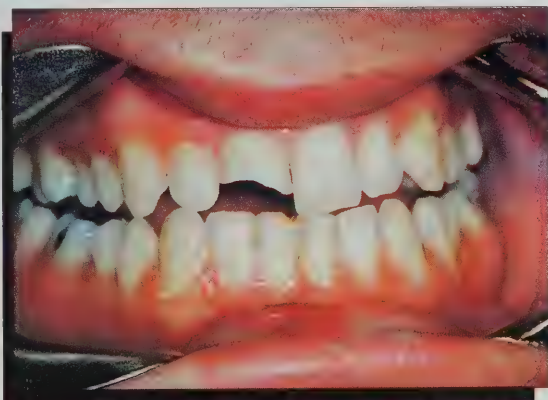


Fig. 1: Fractured right maxillary central incisor crown in an adolescent patient.



Fig. 1B: Closeup view of fractured maxillary incisor crown.

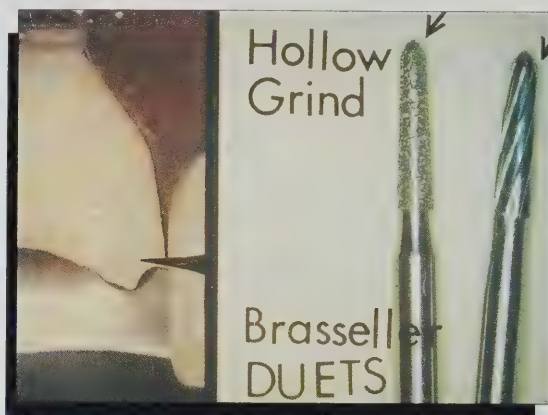


Fig. 2: A bullet-nosed diamond used for the chamber preparation.

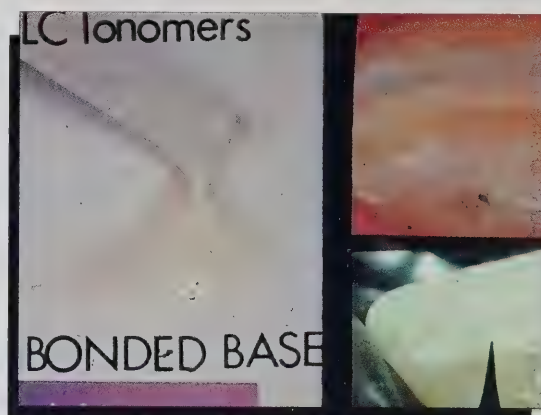


Fig. 3: A light-cured glass ionomer cement is applied to the dentin as a bonded base pulp protective.



Fig. 4: Application of bond resin to the enamel periphery.

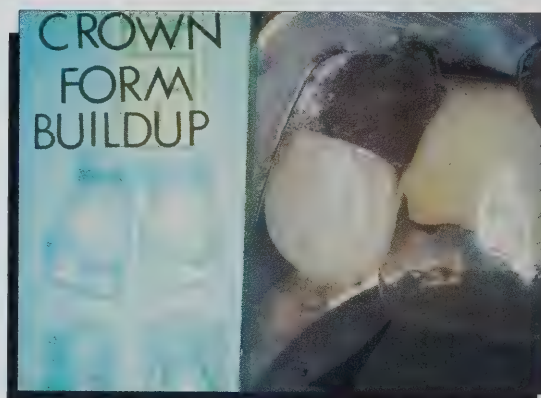


Fig. 5: A thin Swiss crown-form trimmed and fitted into position over the fractured incisor.

ESPE-Premier) to complete the chamfer preparation proximally. The chamfer preparation (**Fig. 2**), which should be circumferential, allows a definite finish line for the composite restoration in addition to providing marginal bulk, which essentially eliminates "White Line" margin. Furthermore, the chamfer preparation allow a "resin-lap joint" that effectively masks the resin-enamel interface.

3. Pulp Protection. In deep situations in close proximity to the pulp, or for direct pulpal exposure, VLC Dycal (L.D. Caulk Co.) should be placed just over the pulp. Otherwise, the dentin should be covered with a multipurpose light-cured ionomer cement such as Fuji II L.C. (GC America Inc.), Vitremer (3M Dental Products Division) or Variglass (L.D. Caulk Co.). Such materials constitute ideal pulp protective systems (**Fig. 3**), since they are biologically compatible, anti-cariogenic, and bond chemically to dentin. Alternatively, one of the

new universal bonding materials such as Allbond 2 (Bisco Inc.) could be used for both enamel/dentin bonding and pulp protection, in one step.

4. Bonding. After phosphoric acid etching of the enamel for 20 seconds, followed by washing and drying, any one of the new universal bonding resins such as Allbond 2 (Bisco Inc.), Scotch Bond Multipurpose (3M Dental Products Division), Tenurebond (Denmat Corp.), Probond (L.D. Caulk Co.) or Prisma Universal Bond 3 (L.D. Caulk Co.) may be used for effective enamel/dentin bonding. It should be kept in mind that Allbond 2, Scotchbond Multipurpose, Tenurebond and Probond are all dependent on dentin/enamel etching. Prisma Universal Bond 3 does not involve dentin etching. After brush application to the dentin/enamel surface (**Fig. 4**) and visible light curing for 20 seconds, the highly reflective air-inhibited surface layer remains.

5. Composite Insertion. A thin crown-form corresponding to the mesiodistal width and incisogingival length of the tooth to be restored should be carefully selected, trimmed and fitted (**Fig. 5**). There are two Swiss-manufactured crown forms that are highly conducive to extensive crown build-up techniques, namely the Odus Pella^a and the Interberg^b crown forms. Both are relatively thin and neither has a raised proximal seam. They are therefore excellently designed for efficient crown build-up and for effective restoration of tight proximal contacts.

After proper trimming and fitting, vent holes should be placed in the crown form palato-incisally to allow for air escape during insertion.

The crown-form matrix should be filled with composite material and inserted into position over the prepared tooth (**Fig. 6**). Anatomically-contoured wooden wedges (13X or 13XT Interdental^c) should



Fig. 6: The crown form is filled with hybrid composite material and seated into position.



Fig. 7: After composite curing, the crown-form material is peeled off using an appropriate instrument.



Fig. 8: The use of a multifluted finishing bur to remove gross marginal excess.

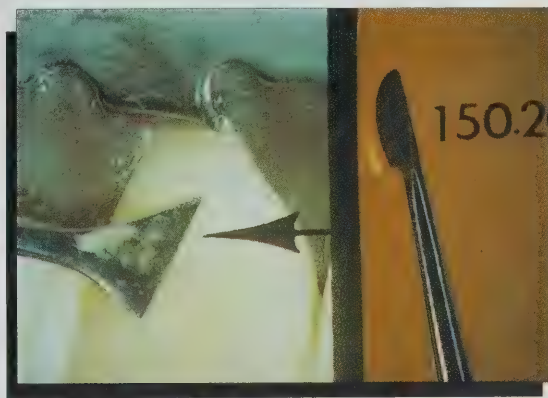


Fig. 9: Final marginal finish using a sharp instrument.

then be placed into the gingival embrasures in order to compress the matrix form into tight adaptive contact with the proximo gingival surfaces, and to ensure a slight amount of separation to allow for the thickness of the matrix.

Careful visible-light curing of the composite material should follow, using a large-end-diameter (i.e. 12-15 mm) light tip for 40 seconds both labially and lingually. The distance from the end of the light tip to the composite surface should not exceed one millimetre. The crown form matrix should then be peeled off (**Fig. 7**), thereby exposing a smooth matrix cured surface with only a small amount of marginal excess.

6. Composite Finishing. A multifluted carbide finishing bur (ET6 or ET9[®]) should be used at ultra high speed to remove gross marginal excess (**Fig. 8**), taking care to ensure that the bur does not break through to the margin. If this occurs, "White Line" margin will result. The finish-

ing bur should be used to remove sufficient excess to result in a thin fin overlying the marginal interface. The final marginal excess should then be removed using a sharp knife or scalpel (**Fig. 9**) or preferably a carbide finishing knife.⁶

The proximogingival region is then stripped carefully using very thin abrasive strips (Epitex; Coe Laboratories Inc., 3737 West 127th St., Chicago, Ill., 60658). The linguopalatal region should be finished using an appropriate donut-shaped stone (WPH 54, J.M. Ney Co. International, Maplewood Ave, Bloomfield, Conn. 06002).

Final finish of the labial contour should be accomplished using aluminum oxide finishing discs (Sof-Lex, 3M Dental Products, 3M Center, 270-5N-02, St. Paul, Minn. 55144) medium fine and superfine in sequential order.

The final lustrous sheen should be attained using an appropriate hybrid polishing paste (Command

Luster Paste, Kerr-Sybron, P.O. Box 455, Romulus, Mich. 48174; or Prisma Gloss, L.D. Caulk Co., P.O. Box 359, Milford Del. 19963). The completed restoration is shown in **Fig. 10**.

Hybrid composite materials closely approach the ideal systems, particularly for crown build-up and class IV and class VI restorations, as they demonstrate a high degree of esthetic acceptability in combination with long-term durability and fracture resistance (**Figs. 11** and **12**).

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Fig. 10a: Completed hybrid composite crown buildup, maxillary right central incisor.



Fig. 10b: Original fractured central incisor (left) and completed hybrid composite crown.



Fig. 11a: A short malaligned maxillary right lateral incisor.



Fig. 11b: Thin crown-form matrix filled with hybrid composite, seated, and visible light cured.



Fig. 12a: Maxillary right lateral incisor after hybrid composite buildup at baseline.



Fig. 12b: Hybrid composite crown on maxillary right lateral incisor at three-year recall.

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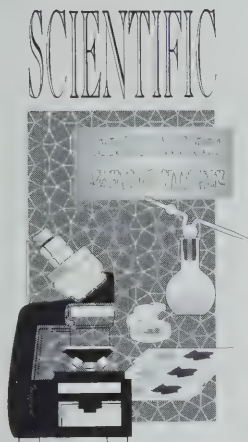
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Restorative Decision Making by Ontario Dentists

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ABSTRACT

One-half of the dentists in general practice in Ontario were randomly selected for a survey in June 1992 to determine their practices and decision-making regarding some aspects of restorative dentistry. Using patient scenarios to describe clinical situations, respondents stated the threshold at which a restoration should be placed in various tooth surfaces of persons of different ages, according to the severity of the carious lesion and the usual restorative procedure for different case situations. A total of 1,276 (52 per cent) dentists responded to a detailed mail questionnaire. Data were entered into a personal computer (PC) and analyzed using frequencies and chi-square with the SPSS/PC+ statistical package. Multivariate analyses were undertaken to examine what characteristics of dentists independently explained variations in their usual restorative procedures for approximal and occlusal caries.

With approximal lesions, as seen on bitewing radiographs, 60 per cent of the dentists indicated that they would place a restoration in a 12 year old with an enamel lesion that had not reached the dentino-enamel junction, whereas with 30- and 55-year-old patients, 28 and 20 per cent, respectively, would do so.

At each patient age, there was a tendency for significantly younger dentists to restore enamel-only lesions more often than other dentists ($p < .01$). Variations in proposed treatment for an adult patient with above average oral hygiene, but with a small (1-1.5 mm diameter) occlusal cavity that had penetrated through the dentino-enamel junction, were also observed. In this case, 23 per cent of the dentists would prepare a conventional cavity extending to include all fissures, and restore the tooth with amalgam or composite; 45 per cent would prepare a cavity just larger than the outline of the lesion and restore it in the same way; 32 per cent would prepare a small cavity and place a preventive resin restoration.

Significant differences in cavity design were also observed between graduates of the University of Toronto and the University of Western Ontario with respect to restoring approximal carious lesions. A number of the dentists' characteristics were significantly associated ($p < .01$) with these variations in procedures. These included the dentist's gender, year and university of graduation, hours of continuing education and type of practice. The documentation and explanation of these large variations in restorative practices have important implications for continuing dental education.

SOMMAIRE

En juin 1992, on a sondé au hasard la moitié des dentistes généralistes de l'Ontario afin d'étudier les décisions qu'ils prennent et les procédures qu'ils effectuent pour les restaurations. À l'aide de scénarios reproduisant des cas cliniques, les répondants ont indiqué: a) le seuil-limite pour restaurer, chez des personnes de tout âge, les lésions aux surfaces dentaires, et b) les procédures qu'ils exécutent dans chaque cas. En tout, 1 276 dentistes (52 p. cent) ont répondu au questionnaire distribué par la poste. Les données en ont été compilées à l'ordinateur et analysées à l'aide d'un logiciel à statistiques avec calcul des fréquences et test χ^2 . Les analyses multivariées avaient pour but de déterminer les caractéristiques qui, chez les dentistes, peuvent expliquer les variations dans les procédures que chacun effectue ordinairement pour les caries interproximales et occlusales.

Dans le cas des lésions révélées par des radiographies interproximales, 60 p. cent des dentistes ont indiqué qu'ils effectueraient une restauration chez un enfant de 12 ans qui présente une lésion à l'émail n'ayant pas encore atteint la jonction émail-dentine, alors que chez les patients de 30 et 55 ans seulement 28 et 20 p. cent respectivement en effectueraient une.

Quel que soit l'âge du patient, on a relevé, plus chez les dentistes plus jeunes que chez les autres ($p < 0,01$), une tendance à restaurer les lésions affectant l'émail seul. On a également relevé des variations dans les traitements proposés pour un adulte jouissant d'une santé bucco-dentaire supérieure à la moyenne, mais présentant une petite carie occlusale (1,0 à 1,5 mm de diamètre) ayant percé la jonction émail-dentine. Dans ce cas, 23 p. cent des dentistes prépareraient une cavité conventionnelle englobant toutes les fissures et restaureraient la dent avec un amalgame ou un composite; 45 p. cent prépareraient une cavité un peu plus grande que le pourtour de la lésion et la restaureraient de la même manière; et 32 p. cent prépareraient une petite cavité qu'ils rempliraient d'une résine de prévention.

Par ailleurs, pour les restaurations des lésions interproximales, on a noté de grandes différences dans la préparation des cavités entre les diplômés de l'Université de Toronto et ceux de l'Université de l'Ontario occidental. Certaines caractéristiques des dentistes ont été associées pour une grande part ($p < 0,01$) à ces différences de procédure, notamment le sexe, l'âge, l'année de l'obtention du diplôme, l'université où ils ont étudié, le nombre d'heures consacrées à la formation continue et le genre de cabinet où ils exercent.

La documentation et l'étude de ces grandes variations en dentisterie restauratrice sont importantes pour la formation continue des dentistes.

Introduction

Recent studies indicate that there has been a significant decline in caries prevalence among young individuals in industrialized countries over the last 15-20 years.¹⁻⁴ This decline has also occurred in children and young adults in the province of Ontario.⁵ Although the reasons for the decline are not completely understood, some can be attributed to the increased use of fluorides over the last three decades. Not only are

fluorides now incorporated in drinking water, toothpastes, and mouth rinses, but they are also periodically applied by dentists during routine dental visits.

Remineralization of incipient carious lesions due to the presence of fluorides is the principal factor explaining the decline of caries prevalence.⁶ Other studies that investigated the rate of progress of caries in approximal enamel from the outer surface to the dentino-enamel junction found that this is a slow process,⁷ which could take up to four years, on average.^{8,9} Moreover, others have found that at least one-half of approximal enamel caries become arrested and do not progress into dentin.^{10,11} Based on similar findings, other studies have suggested that dentists would not be at risk of under-treating if they were to follow systematic remineralization strategies, also known as non-invasive preventive methods, when treating patients with approximal carious lesions confined to enamel.^{12,13}

To examine dentists' decisions in the management of early approximal caries and to relate them to modern treatment philosophies, a number of surveys have been conducted over the last eight years in western Europe (Norway,¹³ Scotland,¹⁴ Holland and Norway¹⁵ and Denmark¹⁶). In one survey, two-thirds of the dentists were found to treat carious lesions, confined totally to enamel, by invasive methods, i.e. by placement of a restoration.¹³ This kind of treatment is now considered to be unnecessary, as there is a good chance that remineralization of enamel carious lesions can be achieved using non-invasive preventive methods.¹⁷ Treatment of an early approximal carious lesion by invasive methods, which may appear to solve the problem in the short-term, involves the removal of a considerable amount of healthy tooth structure in order to gain access to the affected area. Moreover, this creates a number of long-term problems associated with the usual need for replacing the restoration with a larger and more complex one.¹⁸ These problems include: weakening of the tooth, which renders it

vulnerable to fracture during function; time-related breakdown of the restorative material; and, possibly, introducing an open interface between the tooth and the restoration, which invites secondary caries formation.

For these reasons, it is obvious that non-invasive topical fluoride treatments offer a much more attractive and better alternative on both the short- and long-term basis. Even in those situations where an approximal carious lesion is to be treated invasively, for example if the lesion has penetrated into dentin, the restorative methods to achieve this have changed over the last two decades. A slot restoration, which only involves the preparation of a retentive approximal box, is much preferred to a classical full-scale restoration. Such a slot restoration allows greater conservation of healthy tooth tissue.^{19,20} In addition, teeth with approximal slot restorations are less vulnerable to severe cuspal fracture when compared to teeth with classical full-scale restorations.²¹

For a small occlusal carious lesion that requires a restoration to be placed, a preventive resin restoration, now a widely accepted procedure, offers much more conservation of the healthy tooth tissue compared to the classical full-scale occlusal restoration.²²

The purpose of this study was to identify the restorative treatment thresholds of Ontario general dental practitioners (GDPs) and the extent to which they use invasive methods for the treatment of approximal, occlusal and facial or lingual enamel caries, rather than a non-invasive, preventive approach. These dentists' attitudes toward implementing newer conservative treatment methods, when early caries has to be treated invasively, were also examined. To help explain the differences among the dentists, the relationship between their decisions and practices and a number of characteristics were examined. These included the year and university of graduation, gender, type of practice, and hours spent in practice, in professional reading and in continuing dental education courses.

TABLE I

Patient Scenarios and Questions for Restoration of Approximal and Occlusal Carious Lesions

Approximal carious lesion: Please consider the case of an adult patient who in your judgement requires a restoration due to early approximal caries in one approximal surface of a posterior tooth. The adjacent teeth are intact and oral hygiene conditions are above average. Please indicate which one of the following procedures you would ideally implement:

1. A conventional two-surface **amalgam** restoration involving the approximal surface and extending occlusally to include all the fissures.
2. A slot **amalgam** restoration involving the approximal surface and extending occlusally just beyond the triangular fossa on the operating side, but not crossing to the other side of the occlusal surface.
3. A conventional two-surface **composite resin** restoration involving the approximal surface and extending occlusally to include all the fissures.
4. A slot **composite resin** restoration involving the approximal surface and extending occlusally just beyond the triangular fossa on the operating side, but not crossing to the other side of the occlusal surface.

Occlusal carious lesion: Please consider the case of an adult patient who in your judgement requires a restoration in a posterior tooth due to a small occlusal cavity (1-1.5 mm in diameter) which has penetrated through the enamel and DEJ. The adjacent teeth are intact and oral hygiene conditions are above average. Please indicate which one of the following procedures you would ideally implement:

1. Prepare a conventional occlusal cavity which extends to include all the fissures and restore with **amalgam**.
2. Prepare a small occlusal cavity just larger than the diameter of the decay and restore with **amalgam**.
3. Prepare a conventional occlusal cavity which extends to include all the fissures and restore with **composite resin**.
4. Prepare a small occlusal cavity just larger than the diameter of the decay and restore with **composite resin**.
5. Prepare a small occlusal cavity just larger than the diameter of the decay and restore with **composite resin** and seal the fissures with a fissure sealant.

Materials and Methods

A mail questionnaire on restorative and other dental practices and beliefs was sent to a randomly-selected group, consisting of one-half of the general dental practitioners in the province of Ontario, in June, 1992. The survey questions were developed through a review of the relevant dental literature. A draft questionnaire was pretested on a group of seven dentists and revised accordingly. The sample frame used was the alphabetized list of members of the Royal College of Dental Surgeons (RCDS) of Ontario as of May 1992. Identifiable dental specialists, dentists residing outside of Ontario and those holding academic or hospital positions were excluded from the list. A systematic 50-per-cent random sample of names was then drawn from the list, and a questionnaire and covering letter were mailed to the selected random sample on June 5-10, 1992.

Using Dillman's²³ survey methodology, a reminder postcard was sent to all dentists who had not replied by June 29-30, 1992. A third and final mailing consisting of a copy of the questionnaire and covering letter were sent to those

who had not replied by July 28-30, 1992, encouraging them to do so.

To learn about their restorative treatment threshold, the dentists were asked to indicate, using a five-point scale of caries depth for approximal lesions (**Table III**), the minimal point that they felt was the most appropriate for placement of a restoration in posterior teeth for each of three age groups of patients (12, 30 and 55 year olds). They were asked similar questions for lesions on occlusal and facial or lingual surfaces, and were asked to assume that these patients were of average caries susceptibility. Apart

from the primary carious lesion described, there were no other reasons for concern about the tooth in question, and the patients were to be considered similar in all other respects. As described in two other questions, the dentists were asked about the restorative procedures that they normally followed when placing a restoration for an approximal and an occlusal carious lesion (**Table I**).

The returned questionnaires were edited for completeness and coded. The data were then entered into a personal computer using the Epi Info (V5) data-entry module

TABLE II

Details Of the Survey's Sample and Response

Feature	Description	Number
Sample frame	RCDS mailing list of May, 1992	5,743
Target population	General dental practitioners in Ontario	4,938
Selected sample	(Random start) systematic sample	2,484
Non-eligible respondents	Specialists, retired dentists, etc.	34
Eligible respondents		2,450
No response	Did not return questionnaire	1,033
Withdrawal	Returned questionnaire unanswered	141
Respondents		1,276
Per cent response	(Responses/Eligibles) 100	52.1%

TABLE III

Percentage Distribution Of Dentist's Restorative Treatment Threshold For Approximal Caries by Patient Age

The following scale describes approximal lesion severity in a posterior tooth as assessed by bitewing radiographic appearance only. Please indicate the minimum point (threshold) which you consider to be the most appropriate for restoring the tooth for each patient, by circling only one number in each column.			
	Age of patient in years		
Approximal lesion severity	12	30	55
	%	%	%
A zone of generally increased radiolucency confined to outer half of enamel	9	1	1
A zone of generally increased radiolucency involving both the inner and outer halves of enamel up to but not beyond the DEJ	51	27	19
A zone of generally increased radiolucency involving all of the enamel and extending just beyond the DEJ	40	67	67
A zone of generally increased radiolucency penetrating the enamel and DEJ and extending to include outer half of dentin	0	5	11
A zone of generally increased radiolucency penetrating the inner half of dentin	0	0	1
Total percentage	100	100	99
Total dentists responding (n)	1,128	1,130	1,129

screen. Data were subsequently analyzed using frequencies and chi-square with the SPSS/PC+ statistical package. Furthermore, multivariate analyses, both multiple and logistic regression, were undertaken to examine what characteristics of dentists independently explained variations in their usual restorative procedures for approximal and occlusal caries.

Results

Table II records details of the survey's sample and response rate. Of those eligible to respond, 52 per cent (1,276) did so. This analysis, completed just before the final returns were in, is based on 1,210 dentists in active general practice.

Table III gives the percentage distribution of dentists' answers for each patient age in response to the question about the threshold for approximal caries. For a 12-year-old patient, 60 per cent of the responding dentists indicated that they would treat an approximal carious lesion confined to enamel invasively, i.e. by placement of a restoration. This percentage dropped to 28 per cent and 20 per cent for patients who were 30 and 55 years of age, respectively.

When the dentists' responses to this question were further analyzed according to their year of graduation (**Table IV**), more younger than older dentists indicated that they would invasively treat enamel caries at each patient age ($p < .01$). This tendency for younger dentists to treat enamel caries invasively,

especially for older patients, is shown in **Fig. 1**. Even for a 55-year-old patient, 24 per cent of the dentists who graduated between 1980 and 1991 indicated that they would treat enamel caries invasively, whereas for dentists who graduated in 1970-1979 and those who graduated in 1937-1969, the percentages were 16 and 17 per cent, respectively.

When asked about their restorative treatment threshold for occlusal caries, 35 per cent of the dentists indicated that they would place a restoration when there is evidence of a white opacity or grey discoloration around a stained fissure, but without cavitation, if the patient were 12 years of age (**Table V**). This percentage dropped to 17 and 12 per cent with patients 30 and 55 years of age, respectively. However, the majority of dentists would not place a restoration in older patients until the cavity was at least 0.5 mm in diameter and had a soft floor. Unlike the case with approximal caries, relatively more older dentists would restore occlusal surfaces without cavitation, although this difference was only statistically significant with respect to the 12-year-old patient group.

The majority of dentists' indicated that their restorative treatment threshold for facial and lin-

Decisions to restore approximal caries lesions confined to enamel

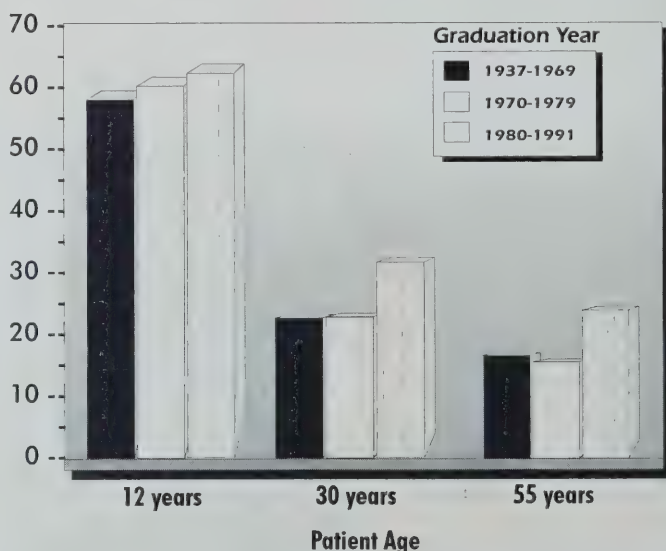


Fig. 1: Decisions to restore approximal lesions confined to enamel. Dentists were divided into three groups according to their year of graduation.



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Restorative procedure followed for early approximal caries

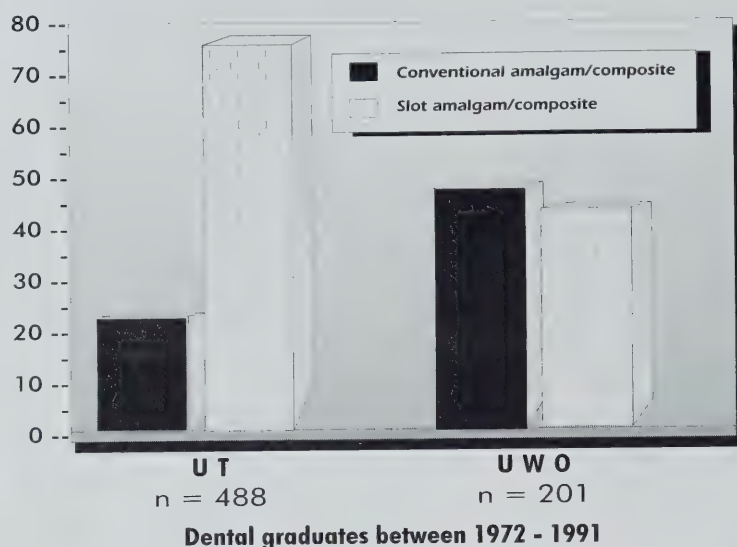


Fig. 2: Restorative procedure followed for early approximal lesions by graduates of UT and UWO between 1972 and 1991.

gual caries was when cavitation less than 0.5 mm occurred, especially with a softened floor. With such cavitation, 86, 80, and 70 per cent of the dentists would place a restoration in persons age 12, 30 and 55 years, respectively. There were no significant differences by year of graduation.

Table VI shows the percentage distribution of dentists, by year and university of graduation, who would place various types of restorations as described in Table I for an early approximal carious lesion that is to be treated invasively. In order to control and better understand observed differences in response, only graduates of the University of Toronto (UT) since 1972 or graduates of the University of Western Ontario (UWO), which graduated its first dentists in that year, were included in this table. For all graduation intervals analyzed, the majority of responding UT graduates indicated that they would elect to place a slot amalgam restoration for this case. But the majority of UWO graduates, with the exception of those graduating in 1987-1991, indicated that they would elect to place a classical (full-scale) amalgam restoration for the same case. The great majority of dentists from each university would use amalgam as the restora-

tive material of choice in this simulated clinical situation.

For the UT graduates, as the year of graduation increases, a gradual increase in the percentage of dentists who would elect to use a slot cavity design in preference to a classical cavity design is observed. The percentage of UT graduates during 1972-81 who would elect to use a slot cavity design was 69 per cent, whereas for dentists who graduated during 1982-86 and 1987-91, the percentages were 80 and 92 per cent, respectively. In contrast, a significantly lower percentage of UWO graduates would use a slot cavity design in preference to a classical cavity design when treating an early approximal carious lesion invasively. However, the response pattern by graduation period is irregular, since for UWO graduates during 1972-81, 50 per cent indicated that

TABLE IV

Per Cent Distribution Of Minimum Restorative Treatment Threshold For Posterior Approximal Caries By Patient Age and Year Of Dentist Graduation

Age of patient		Year of graduation		
		1937-69	1970-79	1980-91
		%	%	%
12 years	in enamel	56	59	62
	just through DEJ	44	41	38
	total percentage	100	100	100
	total responding (n)	(101)	(571)	(456)
	$\chi^2 = 14.5, p = .005$			
		%	%	%
30 years	in enamel	24	24	33
	just through DEJ	69	70	63
	in dentin	08	06	04
	total percentage	101	100	100
	total responding (n)	(316)	(754)	(60)
	$\chi^2 = 14.8, p = .005$			
		%	%	%
55 years	in enamel	17	16	24
	just through DEJ	67	68	67
	in dentin	16	16	09
	total percentage	100	100	100
	total responding (n)	(226)	(761)	(142)
	$\chi^2 = 20.7, p = .0004$			

TABLE V
Per Cent Distribution Of Minimum Restorative Treatment Threshold For Occlusal Caries By Patient Age

Lesion severity	Age of patient in years		
	12	30	55
	%	%	%
White opacity or dark stain	10	03	02
Grey discoloration around stained fissure	25	14	10
Cavity 0.5 mm diameter with hard floor	21	16	13
Cavity 0.5 mm diameter with soft floor	41	56	55
Cavity > 0.5 mm diameter with soft floor	03	12	21
Total percentage	100	101	101
Total responding (n)	(1,131)	(1,129)	(1,127)

they would elect to use a slot design, while for 1982-86 and 1987-91 graduates, 26 and 60 per cent, respectively, would do so. The extreme contrast in restorative decision making between graduates of the two universities is most evident for 1982-86 (Table VI).

Fig. 2 shows the percentage of dentists, by university of graduation, who would elect to use either a classical (conventional) or a slot cavity design when treating an early approximal carious lesion invasively.

Table VII records the percentage distribution of dentists, by year and university of graduation, who would elect to place a classical amalgam or composite restoration, a small amalgam or composite restoration, or a preventive resin restoration when treating a small occlusal cavity invasively as described in Table I. Generally, more UT graduates indicated that they would elect to place a small amalgam or composite restoration in preference to a classical amalgam or composite restoration, relative to UWO graduates. In addition, there was a gradual increase, according to the four increasing periods of graduation, in the percentage of UT graduates who indicated that they would place a preventive resin restoration in preference to the other two choices (29, 33, 35 and 55 per cent).

In contrast, the percentage of UWO graduates who indicated that they would place a preventive resin restoration in preference to a

classical amalgam or composite resin did not follow a linear pattern with the four periods of graduation. For example, 33 per cent of those who graduated between 1977-81

indicated that they would place a preventive resin restoration, while for those who graduated between 1982-86 and 1987-91, the percentages were 22 and 38 per cent, respectively. Except for the 1982-86 period, there was only a small difference between the number of graduates of the two universities who would place a small amalgam or composite in this simulated clinical situation.

Table VIII presents the findings of the multiple regression analyses to help explain the reasons for the variation in responses to the questions about the appropriate type of restoration for an early approximal and a small occlusal carious lesion (Table I). These results are presented for two groups, all respondents and those who graduated from UT or UWO.

For an early approximal lesion, Table VIII lists the five explanatory

TABLE VI
Per Cent Of Dentists, By Year and University Of Graduation, Performing Various Types Of Restorations When An Early Approximal Carious Lesion Is Treated Invasively

Graduation year/univ.	Classical amalgam	Slot amalgam	Classical composite	Slot composite	n dentists
1972-76					
UT	26 %	48 %	5 %	21 %	121
UWO	50 %	35 %	0 %	15 %	34
$\chi^2 = 7.7, p = 0.05$ (expected values of 2 of 8 cells < 5)					
1977-81					
UT	26 %	53 %	5 %	17 %	129
UWO	39 %	33 %	11 %	17 %	64
$\chi^2 = 8.7, p = 0.03$					
1982-86					
UT	14 %	61 %	6 %	19 %	146
UWO	64 %	11 %	11 %	15 %	55
$\chi^2 = 59.3, p = 0.000001$					
1987-91					
UT	5 %	75 %	2 %	17 %	92
UWO	40 %	42 %	0 %	19 %	48
$\chi^2 = 28.0, p = .000001$ (expected values of 2 of 8 cells < 5)					
All years - 1972-91					
UT	18 %	58 %	5 %	19 %	488
UWO	48 %	29 %	7 %	16 %	201
$\chi^2 = 70.3, p = 0.000001$					



TABLE VII

Per Cent Of Dentists, By Year and University Of Graduation Performing Various Types Of Restorations When An Early Occlusal Carious Lesion Is Treated Invasively.

Graduation year/univ.	Classical amalgam or composite	Small amalgam or composite	Preventive resin restoration	n dentists
1972-76				
UT	20 %	51 %	29 %	118
UWO	23 %	49 %	29 %	35
$\chi^2 = 0.11, p = 0.95$				
1977-81				
UT	21 %	46 %	33 %	130
UWO	31 %	42 %	28 %	65
$\chi^2 = 2.4, p = 0.30$				
1982-86				
UT	19 %	47 %	35 %	144
UWO	46 %	32 %	22 %	59
$\chi^2 = 15.7, p = 0.0003$				
1987-91				
UT	4 %	41 %	55 %	91
UWO	26 %	36 %	38 %	47
$\chi^2 = 13.8, p = 0.0009$				
All years - 1972-91				
UT	17 %	46 %	37 %	483
UWO	33 %	39 %	29 %	206
$\chi^2 = 20.7, p = 0.00003$				

variables found to be significantly associated with the decision to use a slot preparation rather than a classical (full-scale) preparation. With all dentists, gender, continuing education, professional reading, community size and the number of patients treated were significant in the manner outlined in **Table VIII**. For the analysis of the subset of dentists who were graduates of UT or UWO, age and university of graduation were newly significant, along with continuing education, number of patients treated and being an associate.

For a small occlusal carious lesion, **Table VIII** also gives the results of the multivariate analysis for those explanatory variables found to be significantly associated with the decision to restore the occlusal lesion with a preventive resin or a small amalgam restoration. For all

dentists, age, gender, and professional reading were significant in the manner described in **Table VIII**. For only the UT and UWO graduates, the three variables mentioned above remained significant, along with hours of continuing education and university of graduation.

Discussion

After three mailings, 52 per cent of the eligible dentists had responded to this long and detailed questionnaire. Although the 1,210 respondents represented all geographic regions and age groups, and the response rate exceeded 43 per cent, which Hovland et al²⁴ have suggested is high enough to be representative, we cannot comfortably state that our findings can be safely generalized to all dentists in general practice in Ontario.

In Swan and Lewis's²⁵ survey of Ontario dentists, 24 per cent of the respondents indicated that they would treat an approximal carious lesion confined to enamel invasively for a patient of unspecified age. This percentage is within the range found in the present study for the three patient ages (20-60 per cent), however, it is smaller than the average percentage (36 per cent) over all three patient ages reported here. Nuttall and Pitts,¹⁴ after whose work our threshold question was designed, reported that 44 per cent of a sample of Scottish dentists indicated that they would treat an approximal carious lesion confined to enamel invasively if the patient were 12 years of age, under conditions similar to the ones described in this survey. For a 30-year-old patient, the Scottish percentage was 20 per cent. These percentages are lower than those found in the present study (60 per cent for a 12 year old and 28 per cent for a 30 year old). Thus, it appears that Ontario dentists are more likely to invasively treat approximal caries confined to enamel than their Scottish colleagues.

Compared to other countries such as Holland and Norway, the Ontario results are more variable. Mileman and Espelid¹⁵ reported that just over 50 per cent of a sample of Dutch dentists would invasively treat approximal caries that has penetrated to the dentino-enamel junction in a 15-year-old patient with low caries activity and adequate oral hygiene. This is lower than the percentage found in the present study for a 12-year-old patient (60 per cent). Espelid et al¹³ reported that 65 per cent of a sample of Norwegian dentists would place a restoration for a patient of unspecified age under similar circumstances. This is much higher than the average percentage for Ontario dentists in the present study over all three patient ages (36 per cent).

Several striking findings emerged from our assessment of the restorative treatment thresholds of Ontario GDPs. The first is the high variability of treatment thresholds within each age group (**Tables III and V**). The findings that many

professional approach), and administrative rules, incentives and penalties (the regulatory approach). Consistent with the educational approach, some have suggested that there is a great need in dentistry for improved teaching of treatment planning, definition of appropriate services, and guidelines for clinical decision-making.²⁹

Frequent performance of invasive treatment for enamel caries and out-dated restorative methods for the treatment of early caries, as our findings suggest, indicate a need for continuing education courses for dentists. Assurance that dental schools are consistently teaching the use of the latest and scientifically proven material in restorative dentistry is also needed. ■

Acknowledgements: This study was supported by an Ontario Ministry of Health Grant (#04170).

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dentists would intervene invasively for all age groups with approximal and occlusal surface lesions is surprising. Despite abundant evidence that approximal caries progresses slowly and that remineralization is the treatment of choice, more than half (60 per cent) of the respondents and, surprisingly, significantly more younger dentists, would place a restoration in an approximal enamel lesion. However, with occlusal and facial/lingual caries, the majority of dentists would wait until clinical cavitation occurs before placing a restoration.

The higher per cent of UT graduates who would use a slot cavity design in preference to a classical cavity design when treating early approximal caries, relative to UWO graduates (Table VI), may be attributed primarily to differences in curricular content between the two universities. In O'Hara and Clark's²⁶ survey of all dental schools in the United States, Canada and Puerto Rico, only 68 per cent of these schools were found to teach the approximal slot restoration. It is likely that the approximal slot restoration was taught with more emphasis at UT than at UWO. Also, the higher percentage of UT graduates who would place a small amalgam or composite restoration in preference to a classical full-scale restoration when treating a small occlusal carious lesion, relative to UWO graduates, is likely due to the same reason.

More dentists who graduated from UWO between 1982-86 indicated that they would use a classical full-scale cavity design when treating early approximal caries in preference to the contemporary slot design, relative to those who graduated between 1972-81 and 1987-91 (Table VI). Whether this was also due to a shift in curricular emphasis during 1982-86 relative to the other two time periods can only be speculated. With respect to UT, there was a gradual increase over time in the percentage of graduates who would use the approximal slot design in preference to the classical full-scale design. This pattern better matches the

TABLE VIII

Summary Of Multivariate Analyses For Restorative Decisions

Multiple Logistic Regression Summary Of the Direction Of Statistically Significant Independent Variables.	
A. All dentists	B. Only UT and UWO graduates
For early approximal caries, increased tendency to place "slot" amalgam or composite restoration is associated with:	
1. Being female	1. Being a younger dentist
2. Reporting high hours of continuing education	2. Reporting high hours of continuing education
3. Reporting high hours of professional reading	3. Being an associate rather than a solo or partnership practitioner
4. Practise in large community	4. Being a UT rather than a UWO graduate
5. Seeing fewer patients each week	5. Seeing fewer patients each week
Multiple Linear Regression Summary Of the Direction Of Statistically Significant Independent Variables.	
A. All dentists	B. Only UT and UWO graduates
For early occlusal caries, increased tendency to place a small amalgam or preventive resin restoration is associated with:	
1. Being female	1. Being female
2. Reporting higher hours of professional reading	2. Reporting higher hours of professional reading
3. Being a younger graduate	3. Being a younger graduate
	4. Reporting higher hours of continuing education
	5. Being a UT rather than a UWO graduate
R ² = 4%	R ² = 9%
(low)	(low)

state of development of the art since, in the literature, the earliest indication for unrestricted use of the slot cavity design appeared in 1973.²⁰

Multivariate analyses were undertaken to try to explain the observed variations in treatment preferences. Year of graduation, hours of professional reading and continuing education, and the community size were significant at one time or another in the various analyses. Many of these relationships were modest and inconsistent. However, the variations associated with year of graduation and between graduates of UT and UWO were more definite and very interesting.

Numerous studies have shown that the variations displayed by dentists in restorative decision-making are large and pervasive.²⁷ Thus, the large differences reported

by the dentists in restorative treatment thresholds and types of restorations recommended in the similarly-described clinical situations of this questionnaire are not surprising. It is important to note that similar variation occurs in more realistic clinical situations.²⁷ Since some variation is inevitable and expected, the issues are whether the variation is harmful to patients' oral health and, if so, what can be done to minimize it.

Excessive variation in service recommendations for the same or very similar patients suggests the probability that under- or over-servicing relative to patients' true needs may occur or that some inappropriate services may be provided. If this were the case, Eisenberg²⁸ has suggested that there are six main ways of altering service patterns. These are education, feedback and participation (the

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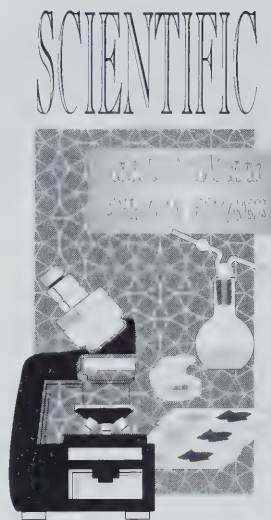
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Dental Caries and Fluorosis in 7-9 and 11-14 Year Old Children Who Received Fluoride Supplements From Birth

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ABSTRACT

One hundred and sixty children who had lived from birth in a region with low fluoride levels in the drinking water, and who had been offered sodium fluoride supplementation in the form of drops for daily use, were examined to evaluate dental caries and dental fluorosis. Two age ranges were selected: 7-9 years and 11-14 years.

In addition to the dental examinations, questionnaires were mailed to the parents, followed-up by telephone interviews, to gather information on compliance with the fluoride supplementation program.

The results showed no statistically significant differences in dental caries activity between the regular and irregular users of fluoride supplementation. Considerable dental fluorosis was found in both regular and irregular user groups of the fluoride supplement (38 to 63 per cent of the children seen), however, with no statistical difference between the user groups. Most of the fluorosis detected was of a mild degree.

Fluoride supplementation under the daily control of a parent or child is not recommended because of the difficulty in maintaining regular

compliance and the risk of fluorosis.

SOMMAIRE

On a examiné 160 enfants qui, depuis leur naissance, avaient habité dans une région dont les eaux avaient une faible teneur en fluorure et qui avaient été soumis à un régime consistant à consommer tous les jours du fluorure de sodium sous forme de gouttes. On voulait savoir s'ils avaient des caries ou souffraient de fluorose. Les enfants appartenaient à deux groupes d'âge: 7 à 9 ans et 11 à 14 ans.

En plus d'examiner les enfants, on a posté un questionnaire aux parents pour ensuite les interroger par téléphone, afin de recueillir des données touchant la consommation des suppléments de fluorure.

Pour les caries, on n'a relevé aucune différence statistique importante entre les enfants qui avaient fidèlement suivi le régime et ceux qui l'avaient suivi de façon irrégulière. Cependant, la fluorose était répandue autant chez les uns que chez les autres (de 38 à 63 p. cent des enfants examinés), mais sans différence statistique entre les groupes. Dans la plupart des cas, la fluorose était légère.

On en a conclu que la consommation de fluorure sous la surveil-

lance d'un parent ou d'un enfant n'est pas recommandée à cause de la difficulté à suivre fidèlement le régime et du risque de fluorose.

Introduction

Fluoride tablets or drops, when used on a daily basis as a method of reducing dental caries, have been shown to be an effective means of fluoride supplementation.¹⁻³

Smyth⁴ compared groups of children who were not using fluoride tablets to those who used them occasionally and those who used them on a daily basis. According to the data presented, a significant difference was observed between occasional users of the fluoride tablets and non-users, with occasional users having a significantly lower number of decayed teeth. Daily users of the fluoride supplement in this study had a significantly lower mean number of decayed and DMF teeth compared to non-users.

In their study, Fanning et al⁵ found that 89 per cent of the children three to four years old, 81 per cent of those aged four to five, and 77 per cent of those aged five to six, who had taken daily fluoride tablets throughout their life, were caries

free. However, the number of caries-free children decreased as the duration of consuming the fluoride tablets decreased.

Regarding the fluorosis experienced by children using a fluoride supplement, Larsen et al⁶ found that a higher prevalence of dental fluorosis was observed among children participating in a non-supervised fluoride tablet program versus children not participating in the program. Kalsbeek et al,⁷ in their study, found a significant relationship between the use of fluoride tablets and dental fluorosis among children who started using the tablets between age 1.5 and 6.

Holm and Anderson,⁸ in a study on 12-year-old children who had been exposed to fluoride tablets and/or fluoride-containing toothpaste from the age of six months, found that these children had a 5.4-times higher risk of developing fluorosis compared to those who had not been exposed to fluoride at this early age.

In contrast to these findings, Stephen et al⁹ found no difference in levels of enamel fluorosis in children who started using a fluoride supplement from birth and those who started using the fluoride supplement at eight years of age, compared to children who had never used fluoride supplementation.

With these conflicting reports in the literature, the opportunity to examine a group of children involved in a fluoride supplement program, in a non-water fluoridated region of Alberta, was initiated to ascertain the relationship between compliance as it related to both dental fluorosis and dental caries.

Materials and Methods

The sample of children in this study was drawn from a group of children enrolled in a supplementation program in the District of Sturgeon Health Unit, located adjacent to Edmonton in central Alberta, Canada.

In all, 2,600 children (from 0 to 14 years of age) were taking fluoride supplements. Children in two main age groups, 7-9 and 11-13, were identified. Three hundred children were selected, as defined

TABLE I

DMFT and dmft For Children Based on Compliance

	number of children	dmft	s.d	DMFT	s.d
7-9 years old (n=90)					
Regular compliance	45	2.20	2.54	0.82	1.17
Irregular compliance	45	3.06	3.07	1.04	1.46
11-14 years old (n=70)					
Regular compliance	33	—	—	2.81	2.59
Irregular compliance	37	—	—	2.40	2.56

by the major independent variable of age. The final number of children examined from this selection process was 266, with children distributed over each of the two major age categories. Children who had not been resident in the region for all of their life were discarded. The initial data collection was completed in the summer of 1987. Parents of the examined children were subsequently approached during the 1987-1988 academic year to obtain additional information on compliance. It was possible to reach the parents of 160 of the original 266 children examined (60 per cent). Parents were contacted directly by phone, and all phone interviews were done by the principle author (Dr. Awad).

Out of the 160 children involved in the second phase of the study, 90 were in the 7-9 age group (49 boys with a mean age of 7.6 years and 41 girls with a mean age of 7.4 years). Seventy children were in the 11-14 age group (40 boys with a mean age 12.5 years and 30 girls with a mean age 12.05 years).¹⁰ The amount of fluoride in the children's drinking water ranged from 0.0 to 0.95 mg/L, due to independent well sources.

Dental caries and fluorosis examination were all performed by two experienced examiners (Dr. Hargreaves and Dr. Thompson) as part of an ongoing study in the region. Dental caries examination was completed using the WHO method and criteria.¹¹ Dental fluorosis was recorded according to the Tooth Surface Index of Fluorosis (TSIF).¹² Four specific permanent teeth were selected as key teeth for assessment: the left maxil-

lary first molars and central incisors, and the right mandibular first molars and central incisors.

Fluoride Supplementation

The Sturgeon Health Unit had developed a computerized fluoride supplementation model, based on an optimum fluoride intake for children in Northern Alberta, relative to humidity and ambient air temperature, of 1.2 ppm of fluoride in the drinking water. Fluoride supplements were prescribed for each individual child based on the fluoride levels in local well water, with the objective of achieving a total fluoride intake for that child that approximated the optimum intake of 1.2 mg/L of fluoride in drinking water.¹³

Each drop of fluoride solution used in the program contained 0.125 mg F, allowing the dose to be flexible, depending on the fluoride levels in the farming community's individual well water supplies. Supplementation programs were commenced in the first year of life and adjusted to a maximum daily intake of 0.5 mg fluoride per day between birth and age 3, increasing to a maximum intake of 1.0 mg fluoride per day between ages 3 and 12.

A questionnaire was mailed to the parents of the children in this study to gain initial information on residency, particularly to determine if the children had lived in the same area all of their lives, or if they had moved there from another area with a different fluoride concentration in the drinking water. Information on the age when toothpaste use began was also recorded.

Compliance

Based on cell numbers, two groups were selected: children taking the fluoride supplementation at least three or more times a week were considered to be regular compliers, while those taking it less than three times a week were viewed as irregular compliers. In 1988, a second questionnaire was used to gain additional information. Parents from each family were contacted by telephone and carefully taken through their questionnaire answers, emphasising the importance of accuracy in recalling the information. Any child whose parents were not sure of his or her use of the supplementation program was discarded.

Statistical Analysis

SPSS (Statistical Package for Social Sciences) was used to analyze the data.¹⁴ Students' t-test was used to compare means of dental caries depending on the frequency of fluoride compliance. The χ^2 test was used to evaluate the number of children with fluorosis depending on the frequency of using fluoride supplements.

Results

Table I indicates the number of children who were regular users of the fluoride supplement, the number of children who were irregular compliers, and the mean of dmft and DMFT for both age groups. The findings show that 50 per cent of the 7-9 age group and 47 per cent of the 11-14 age group were regu-

lar compliers. There was no significant difference between the dental caries levels of the regular and irregular compliers (7-9 years old, p 0.15; 11-14 years old, p 0.4), although the younger age groups did have less caries in the regular compliance group.

When excluding caries-free children (Table II), the mean of dmft and DMFT was examined according to compliance. It can be seen that for the 7-9 year olds, 44 per cent of the children with dental caries in their primary teeth were regular compliers and 50 per cent of the children in the same age group had caries in their permanent dentition. In the older age group (11 to 14), again, 50 per cent of the children with caries in their permanent dentition were regular compliers.

Findings suggested that less dental caries occurred among the regular users of the fluoride supplement, but this was not statistically significant. In the younger group, dmft values for the primary teeth were 3.81 for the regular compliers compared to 4.18 for the irregular users. For the permanent teeth, DMFT values for the regular compliers were 1.76, compared to 2.24 for the irregular users. A similar difference between regular and irregular compliance in the older age group was not shown.

In Table III, the percentage of fluorosis is shown on specific permanent teeth (left maxillary first molar, right mandibular central incisor, left maxillary central incisor

and right mandibular first molar). In both age groups, a high percentage of the molar teeth and the maxillary central incisor teeth showed fluorosis, but less than 20 per cent of the mandibular central incisors had fluorosis.

A comparison was made between the regular and the irregular

TABLE III
Percentage of Children in the Study Group with Degrees of Fluorosis for Four Selected Permanent Teeth

	7-9 years old	11-14 years old
left maxillary first molar		
fluorosis 0	35%	52%
fluorosis 1	57%	40%
fluorosis 2	6%	8%
fluorosis 3	0%	0%
fluorosis 4	2%	0%
fluorosis 5-7	0%	0%
right mandibular central incisor		
fluorosis 0	80%	83%
fluorosis 1	18%	17%
fluorosis 2	0%	0%
fluorosis 3	0%	0%
fluorosis 4	2%	0%
fluorosis 5-7	0%	0%
left maxillary central incisor		
fluorosis 0	42%	35%
fluorosis 1	54%	40%
fluorosis 2	2%	17%
fluorosis 3	0%	3%
fluorosis 4	2%	5%
fluorosis 5-7	0%	0%
right mandibular first molar		
fluorosis 0	44%	69%
fluorosis 1	50%	31%
fluorosis 2	4%	0%
fluorosis 3	0%	0%
fluorosis 4	2%	0%
fluorosis 5-7	0%	0%

TABLE II
DMFT and dmft for Children, Excluding the Caries-Free Children

	Number of children	dmft	s.d	DMFT	s.d
7-9 years old (n=59)					
Regular compliance	26 (44%)	3.81	2.25	—	—
Irregular compliance	33 (56%)	4.18	2.86	—	—
7-9 years old (n=42)					
Regular compliance	21 (50%)	—	—	1.76	1.36
Irregular compliance	21 (50%)	—	—	2.24	1.37
11-14 years old (n=54)					
Regular compliance	27 (50%)	—	—	3.44	2.45
Irregular compliance	27 (50%)	—	—	3.30	2.16

TABLE IV
Number of Children With and Without Fluorosis and their Compliance

Regular compliers			Irregular compliers	
7-9 years old (n=90)				
Fluorosis	absent	23		21
	present	22	(49%)	24 (53%)
11-14 years old (n=70)				
Fluorosis	absent	12		23
	present	21	(63%)	14 (38%)

compliers with respect to fluorosis in the two age groups. **Table IV** shows that, in the seven- to nine-year-old children, 49 per cent of the regular compliers and 53 per cent of the irregular compliers developed fluorosis. In the 11-14 age group, 63 per cent of the regular compliers developed fluorosis, while 38 per cent of the irregular compliers had fluorosis. Ninety-two per cent of the fluorosis observed in both groups was mild (score 1), four per cent was moder-

children was on the fluoride supplement, would put the total number of drops in juice and divide the juice among the children regardless of the number of drops prescribed for each individual.

All the children were regular users of fluoride-containing dentifrices. Dentifrices, therefore, were not used as a variable in the analysis of findings.

Discussion

This study was undertaken to evaluate the effect of fluoride supplementation on the teeth of children with respect to dental caries and fluorosis.

In the 7-9 age group, a trend toward lower caries activity was observed between children who were regular users of the fluoride supplement compared to the irregular users, although this was not confirmed statistically. A similar trend has been shown by other researchers.^{4,5} However, in the older children (11-14 age group), the difference between the compliance groups was not seen. This confirms the results of Kalsbeek et al,⁷ who found that fluoride tablet use had little effect on dental caries experience.

In both user groups — regular and irregular users of the fluoride supplements — between 38 and 63 per cent of children exhibited dental fluorosis, and no statistical difference could be found between the groups. Those results suggest that fluoride supplements, taken on a regular or an irregular basis, caused dental fluorosis in a high percentage of the children, even though the level of fluorosis was of a mild degree.

The data regarding fluorosis distribution on the older children's permanent dentition show that maxillary central incisors were the most affected, followed by the maxillary first molars, mandibular first molars and mandibular incisors. This also was observed in the younger children, except for the maxillary first molars, which appeared to be more affected than the maxillary incisors. This could be explained by the findings of Thylstrup and Fejerskov,¹⁵ who suggested that a significant portion of the variance of dental fluorosis can be explained by a reduction in enamel thickness. This data also showed that the younger children had distinctly more teeth affected with fluorosis than the older ones, with the exception of the maxillary central incisors. This trend has also been reported by Horowitz et al,¹² who found that the maxillary molars and central incisors were more affected in younger children. One explanation suggested by Aasenden and Peebles¹⁶ was that abrasion or continuous mineralization may diminish the milder forms of fluorosis with time. Thylstrup and Fejerskov,¹⁵ who found that the occlusal surfaces of posterior teeth generally showed less fluorosis than the buccal and lingual surfaces of the same teeth, also suggested that abrasion might lower the fluorosis score. Another explanation suggested for age differences is that younger children may have consumed more fluoride during tooth development, due to a greater availability of fluoride from multiple sources, than had been available to the elder children at the time when their corresponding teeth developed.¹⁷ For example, more fluoridated tooth paste is available today, as well as fluoride from beverages made in fluoridated regions.¹⁸

The American Dental Association (ADA)¹⁹ has not recommended additional fluoride supplement when fluoride in the drinking water is above 0.7 ppm. Recent Canadian recommendations²⁰ state that fluoride supplements should not be prescribed for children from birth to three years of age. Before prescribing fluoride supplements, consideration should be given to

TABLE V
Method of Administering the Fluoride Supplement

Method	Number of Children
Juice	119
Water	27
Milk	10
Others (or directly)	4

ate (score 2 and 3) and two per cent was more severe.

In **Table V**, the method used by parents to give their children the fluoride supplementation drops is shown. The majority of the children were given the supplement in juice, 17 per cent in water and six per cent in milk. Only two per cent of parents used other methods, or gave the supplement directly to the child. When parents were asked about the number of drops given to each child, they claimed to follow the amount prescribed by the Health Unit. However, some parents, when more than one of their

the other sources of fluoride available to the child. However, the use of fluoride supplements from birth, where optimal amounts of fluoride from the water supply are not available, has been emphasized by some authorities in order to assure an ingestion of fluoride before tooth eruption and the incorporation of fluoride into the superficial layers of the tooth enamel with the possibility of providing more resistance to dental caries.²¹

An important part in this study was the total dependency on the parents' responses to the compliance of their children. It sometimes was difficult for the parent to recall retrospectively the frequency of administering the fluoride supplement for such a long period of time. Although most of the parents claimed at the time of the interview that they did not stop giving the drops to their children, the irregularity of administering the supplement could have varied from once a week to once a month or even less. The parents were not always able to be specific, and it is possible that supplementation could have stopped for short periods of time.

The success of the daily home administration of fluoride supplementation depends on the cooperation of the parents. Alternative ways of administering fluoride supplements could be, for example, through school systems. Supplements have been shown to be an effective, successful approach in several studies.¹⁸ Based on the findings from this present study and other reported studies, it is important to evaluate the risks as well as the benefits involved in the use of fluoride supplementation as an alternative to water fluoridation. Fluoride supplementation could help in reducing dental caries but, because of the difficulties of compliance and the high expense of using a supervised regimen, alternatives through topical applications, such as individual annual applications of fluoride by dental professionals and school mouth rinsing, together with fluoride toothpaste use, should be considered as being preferable in community programs. Based on the findings of this study, fluoride supplementation under the control of

the parent or the child could place the child at risk for developing fluorosis when the supplements are taken either regularly or irregularly. ■

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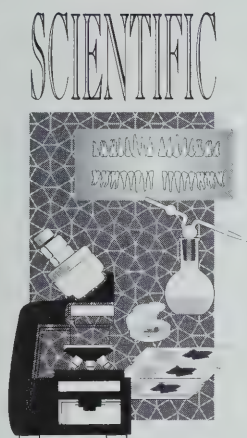
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Hepatitis C: Rapid Progress In Medicine and Implications For Dentistry

Joel B. Epstein, DMD, MSD

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ABSTRACT

Recent developments in the recognition and diagnosis of the major infectious cause of post-transfusion hepatitis, hepatitis C virus (HCV), have led to an explosion in research. These developments are of relevance to dental providers. Patients may now present to the dentist with a diagnosis of hepatitis C infection and may be undergoing medical treatment for this disease. The risk for transmission of HCV in the dental setting is minimal. The dentist must understand the implications for the diagnosis of HCV for the patient and for the provision of dental care.

SOMMAIRE

Les dernières découvertes touchant la reconnaissance et le diagnostic de la principale cause d'infection de l'hépatite sérique ou post-transfusionnelle, le virus de l'hépatite C (VHC), ont fait exploser les recherches. Ces découvertes intéressent le dentiste parce que des patients reconnus infectés par ce virus peuvent se présenter chez lui pendant qu'ils se font soigner pour cette maladie. Bien que les risques de transmission du VHC soient minimes au cabinet, il importe pour le dentiste de comprendre les conséquences que peut avoir le traitement d'un patient infecté et de connaître les dispositions à prendre en pareil cas.

Introduction

Blood-borne pathogens have received a great deal of attention in the medical and dental literature as well as the lay press. This has centred principally around the human immunodeficiency virus (HIV) and hepatitis B virus (HBV).

In the early 1970s, hepatitis B antigen was identified, leading to the development of tests for various antigens and antibodies that appear during HBV infection. This allowed identification of carriers of the virus, screening of blood products, and resulted in development in the 1980s of a vaccine for HBV. At the time, it was thought that HBV was a major cause of post-transfusion hepatitis. However, since screening of the blood supply for HBV was introduced, little reduction in post-transfusion hepatitis has been seen.¹ The search for the probable viral etiology of post-transfusion hepatitis culminated in the identification of a virus associated with the majority of non-A non-B hepatitis (NANBH),² which was subsequently named hepatitis C virus. A recent report reviewed NANBH and dentistry.³ This paper will focus on advances in our understanding of HCV in the past two years.

Diagnosis

The principal cause of NANBH has been identified as HCV,¹ which

is a RNA virus, probably of the flavivirus family^{3,4} (Table I). In the past, the diagnosis of NANB hepatitis was based on clinical and laboratory findings in the absence of markers for known causes of viral hepatitis. The current tests assess the presence of antibodies to HCV. Because these tests identify the presence of the host response to the virus, without directly identifying the virus, they do not define whether the initial infection is current or in the distant past, nor whether the virus is continuing to replicate. The number of patients with antibody who have active viral replication is not known. Some patients may have cleared the virus, while others may be carriers or have active progressive disease with the potential for transmission of infection.¹

It is pertinent to note that because the antibody tests currently available for diagnosis of HCV infection are still in the process of evolution, the sensitivity and specificity of these tests are still not optimal. Therefore, false negatives and false positives may occur. A more direct technique for studying HCV is to measure the presence of viral nucleic acid. The detection of nucleic acid sequences is conducted using the polymerase chain reaction (PCR), a technique that multiplies the number of copies of the viral genome in order to allow identification.



TABLE I
Comparison of Blood Borne Pathogens of Hepatitis

	Virus	
	Hepatitis B	Hepatitis C
Viral nucleic acid	DNA	RNA
Incubation period	2-6 months	2-3 months
Sexual transmission	+++	+
Complications:		
mortality from acute infection	1-2 %	unknown
complete recovery	common	rare
carrier state	+ (5-10%)	++ (up to 50%)
chronic liver disease	+ (approx 5%)	++ (up to 50%)
hepatocellular carcinoma	+	+ (probable)
Patient to dentist transmission	++	+
Dentist to patient transmission	yes	possible

The Illness

The Centers for Disease Control in Atlanta estimate that between 150,000 and 170,000 cases of HCV occur annually in the United States.⁵ The incubation period is generally six to eight weeks. Although seroconversion has been demonstrated in some individuals as much as 26 weeks following exposure, this may be an artifact of the tests used for diagnosis.⁶ The majority of patients are asymptomatic or develop minimal symptoms. Symptoms of infection may be nonspecific and may include fatigue, anorexia, malaise, fever, headache, muscular pain, nausea, abdominal and joint pain, and jaundice. Jaundice occurs in approximately one quarter of infected individuals.¹ When it is present, dark urine, yellow sclera, and a yellow cast to nonkeratinized oral mucosa (most commonly soft palate, ventral tongue and floor of the mouth) may be observed. Additional manifestations may include blood changes such as transient agranulocytosis and anemia. The long-term complications of chronic hepatitis, cirrhosis and hepatic failure are more common in HCV than in HBV infection. However, not all patients who become seropositive will develop liver dysfunction.⁶

The principal concern is that 50 to 60 per cent develop chronic hepatitis and remain chronic carriers, and, of these, half will continue with active liver disease progressing to cirrhosis and, in some cases, hepatocellular carcinoma.¹ Liver function is compromised in 20 to 50 per cent of these people.⁵ The potential for chronic infection by HCV should be contrasted with that of HBV, where approximately 10 per cent of carriers will remain carriers for six months, and one-half of this population will remain chronic carriers indefinitely. In the case of HCV, up to 50 per cent of carriers will remain chronically infected and, once chronic, recovery is uncommon. A relationship between HCV and hepatocellular carcinoma has been discussed.⁷

Epidemiology

NANB hepatitis may account for up to 50 per cent of all cases of acute hepatitis,^{3,8} and up to 90 per cent of all post-blood-transfusion hepatitis may be due to HCV.³ Seroprevalence increases with age. The incidence is much higher in individuals with prior blood product or parenteral exposures: the infection occurs in 25 to 86 per cent of injection drug users, and 56 to 85 per cent of hemophiliacs.^{9,10} However, many individuals without parenteral or blood product ex-

posure also demonstrate antibody to HCV.¹ Surrogate markers of hepatitis such as elevation of liver enzymes, demonstrate poor correlation with the presence of anti-HCV antibodies.^{11,12} As many as 80 per cent of patients with anti-HCV antibodies may be infected with HCV and may be infective, although estimates vary widely.¹⁰ With the advent of screening of blood products for anti-HCV, the risk of transmission of HCV is expected to be dramatically reduced.^{13,14}

Studies in blood donors in some (mostly western) countries have demonstrated a much higher incidence of HCV antibodies (0.41 per cent to 2.5 per cent) than antibodies to HBV.^{1,10-12,15} The rate in high prevalence areas is up to 5.5 per cent.¹⁶ Higher incidence is present in Asia and Africa. For example, in Egypt 24.5 per cent of cases of acute viral hepatitis have been attributed to HCV.¹⁷ In some countries, the seroprevalence of HCV, although high, is much lower than the seroprevalence of HBV.¹⁸ The risk for HCV seropositivity correlates with age, HBV seropositivity, HIV seropositivity, a stable sexual relationship with a HCV-positive individual, multiple sexual partners per year, and injection drug use. While the risk of transmission of HCV from mother to infant remains to be determined, one study has implicated salivary transmission of HCV from mother to child rather than through breast milk.¹⁹

HCV has been identified in most body fluids, including saliva, of HCV-infected individuals. PCR has been used to detect the presence of HCV-RNA.²⁰⁻²² Up to one-half of HCV-infected patients carry HCV-RNA in their saliva.¹⁹⁻²¹ The presence of HCV in saliva may correlate with HCV viremia.²¹ However, one study did not identify HCV-RNA in saliva in 14 patients with chronic hepatitis C.²² The efficiency of transmission from saliva appears to be low, as shown by the lack of transmission from patients with documented HCV in saliva to spouses in five cases in a longitudinal study.²¹

However, saliva may be the route of transmission from mother

to infant,¹⁹ and it may be one of the factors responsible for infection in those without identified risk factors. Because up to half of the sporadic cases of HCV in the community occur without known risk factors, the possibility of other modes of transmission, even oral, remains to be determined.¹

Most documented cases of HCV transmission are related to the use of contaminated blood or blood products and injection drug use. Rates of seropositivity have been as high as 86 per cent in hemophiliacs.²³ The potential for sexual transmission is not clear, but the risk appears to be low.¹ Studies of sexual partners of HCV-positive patients have shown a seven- to eight-per-cent risk,^{24,25} with the highest rate reported as 28 per cent in homosexual males.²⁶ In a study of 136 HIV-infected persons, 29 per cent were HCV antibody positive.²⁷ In a study carried out in British Columbia, 13 per cent of homosexual men and 64 per cent of injection drug users were HCV antibody positive, but in neither group did HCV positivity correlate with HIV antibody positivity (Sherlock, C.H., unpublished data). Injection drug use is a high-risk activity, and from 48 to 81 per cent of intravenous drug users test positive for HCV antibodies.^{3,23} In contrast to HBV, many individuals may be infected by HCV without a history of high risk activities or medical therapy.

Risk for Health Care Workers

There is continuing interest in the study of health care workers (HCWs) who may be at increased risk of HCV infection. Hemodialysis has been documented to be a risk factor, apart from blood or blood product transfusion.²⁸ All 22 nurses in a hemodialysis unit were assessed for the prevalence of HCV infection.²⁹ Although 19 per cent of 125 patients were anti-HCV positive, only one nurse was found to be anti-HCV positive, and this condition predated her nursing career.²⁹ In all, 150 staff people in hemodialysis units were studied. Two per cent were positive for HCV, whereas 17 per cent were

HBV positive.³⁰ Nine to 11 per cent of patients were HCV positive prior to receipt of blood products.^{23,30} In those with prior transfusions, 17 per cent were positive.³⁰ Taken together, these data demonstrate that infection may occur without known risk factors and that work in health care may not carry additional risk.³⁰ In another study, 46.7 per cent of the patients and 2.9 per cent of the staff of a hemodialysis unit were found to be anti-HCV positive.³¹ HCV was found to be a major cause of hepatitis in hemodialysis patients, and the rates appear to be higher than those of most North American populations, indicating a low but increased prevalence of HCV in HCWs.³¹ In a large study in Japan, 564 patients and 145 staff members were assessed for the presence of HCV and hepatitis.⁸ Anti-HCV antibodies were present in 18 per cent of patients, and two per cent of medical staff were also positive, as compared to the population prevalence of 0.9 per cent.⁸ Of the anti-HCV-positive patients, over half had altered liver enzymes, and over half were also HBV infected. Of the staff, only two per cent were HCV positive, but 17 per cent were HBV positive due to prior infection (HBV-core antibody).⁸ Hospital staff (n = 1,097) and acupuncturists (n = 183) in Japan were assessed for the presence of anti-HCV markers, and a low occupational risk that was not statistically higher among HCWs than among controls was demonstrated.¹⁶ No excess prevalence of antibody to HCV was seen in hospital staff in a study conducted in Turkey.³²

A single case of seroconversion following a needle-stick exposure during the treatment of an HCV-positive patient has been reported.³³ Two cases of symptomatic hepatitis C were detected in HCWs 1.5 and two months following percutaneous exposure.³⁴ A German study identified that the prevalence of anti-HCV was 0.6 per cent in hospital personnel — more than the 0.1 per cent rate found in the control population — indicating a low but significantly higher risk for HCWs.⁸ Eighty-one HCWs were followed for 12 months after experiencing needle-

stick injuries from patients who were anti-HCV antibody positive, and no cases of seroconversion nor cases of hepatitis were detected.³⁵ Needle-stick injury from positive patients resulted in seven cases of HCV infection, yielding a 10 per cent risk of transmission with subsequent subclinical or transient hepatitis in all but one case.³⁶ A total of 125 HCWs with parenteral exposures to the blood of HIV-infected patients and 33 HCWs without exposure were assessed to determine the risk of HCV from percutaneous exposure. The seroprevalence of the patients was estimated to be more than 50 per cent, and in those followed-up for approximately 18 months, no new seroconversions were seen despite approximately two-thirds reporting parenteral exposures during follow-up.³⁷ The risk of HCV seropositivity in HCWs with direct patient contact was higher than that in HCWs without patient contact, although only two per cent of 294 HCWs were anti-HCV positive.³⁸ Sera of 1,033 HCWs were assessed (0.58 per cent positive) and compared against samples from 2,113 volunteer blood donors (0.24 per cent positive), demonstrating an increased prevalence of anti-HCV in HCWs.²⁶ The occupational risk of hepatitis among physicians, dentists and other health care workers was assessed from the 1976-1986 public health records of Lower Saxony, Germany.⁴⁰ All health care providers, including dentists, were at greater risk than the general population for NANB hepatitis. The prevalence of HBV causing hepatitis among HCWs remained higher than that of the general population, but has been declining in more recent years.⁴⁰ Therefore, there is an increased risk of HCWs to HCV, although it is low relative to the risk of infection following HBV exposures.^{8,16,26,29,35-40}

HCV has been detected in saliva,^{19-21,41-46} and the potential for salivary transmission of HCV has been demonstrated from both animal^{41,43} and human bites.⁴⁴ HCV-RNA has been demonstrated in the saliva of three patients with post-transfusion hepatitis. However, viral titres were lower in saliva than in serum.⁴⁶ HCV was identified in



the saliva of one-third of six patients with chronic hepatitis due to HCV.⁴⁵ In addition, HCV was identified in the saliva of five of 10 mothers with chronic HCV, but was not present in breast milk. However, in two babies, HCV-infection was documented at 10 months of age.¹⁹ HCV in saliva may represent a route of potential transmission of sporadic cases, however, this does not appear to be a common route of transmission.

The occupational risk for dentists was assessed in a sero-prevalence study in New York.⁴⁷ A history was collected in order to exclude individuals who admitted to risks other than dental practice.⁴⁷ Anti-HCV was found in 1.75 per cent of dentists, compared with 0.14 per cent of controls. Similarly, anti-HCV was detected in 9.3 per cent of oral surgeons compared with 0.97 per cent of other dentists.⁴⁷ The seropositive dentists claimed to have treated more intravenous drug users. This study demonstrated an increased infection

risk for surgical specialists and a lower risk for general dentists, but the risk for both groups were above the rates found in the general population. In contrast, another study of 94 dentists did not identify any with HCV antibody, based on a second-generation test for anti-HCV.⁴⁸

Emerging Therapy

Interferon alpha is the current therapy for hepatitis caused by HCV. Improvements in symptoms, in liver function tests and in histologic findings have been shown in approximately 60 per cent of patients at the end of one year of treatment.¹ The side effects of interferon may include fever, dry skin, diarrhea, depression, fatigue and decreased platelet counts. Late side effects may include increased urinary tract infections, the development of auto-antibodies and hypo- or hyperthyroidism. A vaccination has not been developed, but active research is continuing.

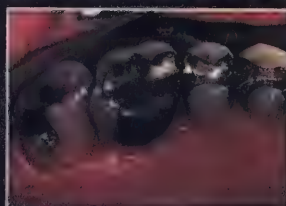
Implications for Dental Care Workers

Of concern to dental care providers is the potential for chronic infection with the attendant risks of end-stage cirrhosis and possibly hepatocellular carcinoma. The dental provider must be cognizant of possible hepatocellular dysfunction, which may affect a patient's ability to detoxify drugs and to produce blood clotting factors.⁴⁹ In addition, HCV-infected individuals may also carry other blood borne pathogens, including HBV and HIV.

The greatest concern for the delivery of dental care is with respect to liver function, hemorrhage, and liver detoxification of medications. Blood clotting may be affected because synthesis of clotting factors in the liver may be reduced. Screening of clotting function is indicated in known cases prior to surgery. Prothrombin time (PT) and partial thromboplastin time (PTT) should be assessed. Liver enzymes and bilirubin may be elevated due

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Summary

Patients at risk for HCV are those who have received blood-transfusions or blood products prior to 1992, when screening of the blood supply for HCV was initiated. Patients who have received hemodialysis or plasmapheresis, and intravenous drug users are additional risk groups. Sexually-active HCV-positive individuals and promiscuous persons with multiple sex partners may also be at increased risk. However, many patients have no identifiable risk factors, making the identification of risk factors unreliable for screening purposes. Therefore, the universal application of appropriate infection control measures is needed. There are no reports of transmission of HCV from patient to dental provider. However, there are reports of transmission from infected patients to health care providers, and it is ex-

pected that dentists are at similar risk. Epidemiologic studies indicate a low but increased risk for HCWs compared with the general population. In addition, the possibility of transmission from dentist to patients has been suggested in two studies.^{50,51} It is expected that currently-recommended infection control measures will be appropriate for the prevention of transmission of HCV. ■

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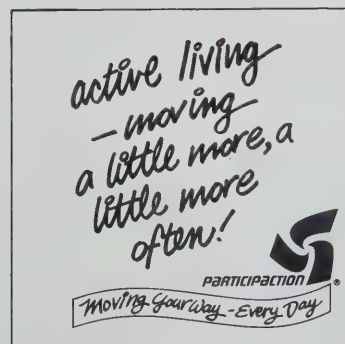
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BOOK REVIEWS

Equilibration in the Natural and Restored Dentition, A Rational Basis for and Technique of Occlusal Equilibration

by Hyman Smukler, BDS, DMD, HDD

Quintessence Publishing Co., 1991, 136 pages

The subject of occlusion has traditionally been very difficult to learn and understand. The foundation for any instruction in dentistry should be based on sound clinical and laboratory studies, although the few who discuss occlusion rarely substantiate their conclusions on such evidence and usually rely on dogma, creating the potential for confusion. The influence of occlusion on the masticatory system and mandibular dysfunction has also been traditionally a controversial and confusing point of discussion. Understanding when, where and how to perform occlusal therapy in a simplified manner is the key to proper diagnosis and treatment in occlusal therapy.

The author, using a simple to read format, does an excellent job of explaining the influence of occlusion on the stomatognathic system. The text is subdivided into five sections containing 13 chapters

covering the broad spectrum of occlusion. Each chapter deals with a different topic of occlusion, with ample literature support to substantiate the author's conclusions. (In fact, this text provides a good literature review resource.) The author also supplements his discussions with excellent clinical photographs and radiographic views to further clarify the subject discussed. One aspect I feel makes this textbook quite superior to other instructional manuals is the author's use of tables and summaries, which are strategically placed so that the issue addressed is reinforced in the reader's mind. Schematic diagrams along with the author's ability to simplify the topics discussed makes for easy understanding and recall. In Section 5, "The Indications For Occlusal Therapy, Classification of Occlusal Interferences, and the Methods and Principles of Occlusal Therapy," this approach is particularly well presented. The use of oversized illustrations of articulated tooth surfaces provides an excellent adjunct to the author's explanations of occlusal adjustments, as well as providing an excellent laboratory exercise for clinicians.

The first section addresses the neuromuscular, occlusal and temporomandibular influences on the masticatory system. This provides

an anatomical platform to initiate discussion on diagnosis and treatment of mandibular dysfunction, which is done at the end of the section.

Section 2 focuses solely on the occlusal influences on the dental attachment apparatus. This section goes into detail about explaining occlusal traumatism. The use of photos, diagrams and summary tables truly takes the mystery out of this topic — a must section for any clinician to read.

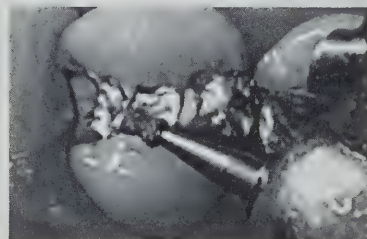
Sections 3 and 4 cover the topic of mandibular function in health and disease. The author describes how and what we should be looking for in a clinical exam, both intra- and extra-orally. Patient history and radiographic exam are also emphasized.

In conclusion, this text provides a solid foundation for the instruction of occlusion, aided by the use of clinical photos, radiographic views, and schematic diagrams. It is written in an easy to read format, with ample summary tables to tie the whole discussion together and provide for easy recall. The text also provides a good literature review on the topics discussed, which sets the foundation for its content.

Reviewed by:
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ONTARIO - University of Western Ontario: Dental Class of 1984 will be holding its 10 year meeting (Reunion) at the ODA Spring Convention on Friday April 22, 1994 - location to be

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Our annual Bermuda Dental Association Convention will be held at the Hamilton Princess Hotel, Pembroke, on July 4th, 5th and 6th 1994.

GUEST SPEAKER: Linda L. Miles, C.SP., C.M.C.
Dynamic Practice Management

Registration Fee: \$350.00 U.S., includes cocktails, wine and cheese party on arrival night, coffee and refreshments during lectures and cocktails at closing reception.

Hotel accommodations should be made as soon as possible with your local travel agent, or by calling the Hamilton Princess at 1-800-223-1818 in the U.S. or 1-800-268-7176 in Canada.

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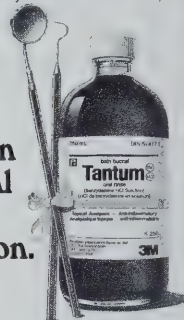


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Oral rinse™ Tantum

(Benzdamine HCl Solution)



**Prescription
relief of oral
pain and
inflammation.**

Summary of prescribing information

THERAPEUTIC CLASSIFICATION
Topical Analgesic — Anti-Inflammatory

Action

Animal studies using the parenteral route have shown that "Tantum" Oral Rinse possesses properties of an analgesic—anti-inflammatory agent. This effect is not mediated through the pituitary-adrenal axis. Studies using the topical route have demonstrated the local anesthetic properties of benzdamine hydrochloride. In controlled studies in humans with oropharyngeal mucositis due to radiation therapy, "Tantum" Oral Rinse provides relief through reduction of pain and edema. Similar studies in patients with acute sore throat demonstrated relief from pain.

Indications

"Tantum" Oral Rinse is indicated for relief of pain in acute sore throat and for the symptomatic relief of oro-pharyngeal mucositis caused by radiation therapy.

Contraindications

"Tantum" Oral Rinse is contraindicated in subjects with a history of hypersensitivity to any of its components.

Precautions

The use of undiluted "Tantum" Oral Rinse may produce local irritation manifested by burning sensation in patients with mucosal defects. If necessary, it may be diluted (1:1) with lukewarm water. Since "Tantum" Oral Rinse is absorbed from the oral mucosa and excreted mostly unchanged in the urine, a possibility of its systemic action has to be considered in patients with renal impairment.

Use In Pregnancy

The safety of benzdamine HCl has not been established in pregnant patients. Risk to benefit ratio should be established if "Tantum" is to be used in these patients.

Use in Children

Safety and dose directions have not been established for children five years of age and younger.

Adverse Reactions

The most frequent adverse reactions reported are: local numbness (9.7%), local burning or stinging sensation (8.2%), nausea and/or vomiting (2.1%). The least frequent were reports of throat irritation, cough, dryness of the mouth associated with thirst, drowsiness and headache.

Treatment of Overdosage

There are no known cases of overdosage with benzdamine HCl gargle. Since no specific antidote for benzdamine is available, cases of excessive ingestion of the liquid should receive supportive symptomatic treatment aimed at rapid elimination of the drug.

Dosage and Administration

Acute sore throat: Gargle with 15 mL every 1 1/2 to 3 hours keeping in contact with the inflamed mucosa for at least 30 seconds. Expel from the mouth after use.

Radiation Mucositis: Use 15 mL as a gargle or rinse repeated 3-4 times a day, keeping in contact with the inflamed mucosa for at least 30 seconds and then expel from the mouth. Begin "Tantum" Oral Rinse the day prior to initial radiation therapy; continue daily during the treatment and after cessation of radiation until the desired improvement is obtained.

Availability

Tantum Oral Rinse is available in 100 and 250 mL bottles. "Tantum" Oral Rinse is a clear yellow-green liquid containing 0.15% benzdamine hydrochloride in a pleasant-tasting aqueous vehicle with 10% ethanol.

Product monograph is available on request.

References:

1. Simard-Savoie S and Forest D. *Curr Ther Res* 1978; 23(6):734-45.
2. Whiteside MW. *Curr Med Res Opin* 1982;8:188-9.
3. Wethington JF. *Clin Ther* 1985;7(5):641-6.
4. Product monograph.
5. Yankell SL. Evaluation of benzdamine HCl in patients with aphthous ulcers. *The Compendium of Continuing Education* 1981; 11(1).
6. Epstein JB. *Int J Radiation Oncology Biol Phys* 1989; 16(6):1571-5.

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82ND WORLD DENTAL CONGRESS • VANCOUVER OCTOBER 2ND TO 8TH, 1994

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In most international dental meetings, enrolment fees are quite substantial, sometimes bordering on the astronomical. These fees are often necessary to underwrite the cost of presenting a high calibre scientific program that will be of interest to every member of the dental team. Why, then, is FDI 1994 different?

FDI 1994, managed by CDA Conventions, has been able to keep registration fees very low for members of CDA, their staff and family,

thanks to the generosity and cooperation of its sponsors. It is with their help that an outstanding scientific program, fascinating social events and special activities have been designed for the benefit of all participants. Canadian dentists will have the opportunity to share in an event of international scope, to meet colleagues from around the world and to learn of new developments in the field of dentistry. All because of the generous contribution of our sponsors! In other words, the 82nd World Dental Congress would not be possible if it were not for sponsorship.

Sponsors are exhibitors who have chosen to go a step further; they are people and companies working hard not only in planning their participation and their booths at the Dental Trade Exhibition but also in sharing their human and financial resources to make FDI 1994 the tremendous Congress that awaits you.

Sponsorship permeates many aspects of the Congress and in varying degrees. Numerous lectures and symposia are offered through the generosity of sponsors such as Aurum Ceramic, Colgate Oral Pharmaceuticals, Dentsply Canada, Ellman International, Exan, Du-Friedy, Nobelpharma, Procter & Gamble, Pro-Dentec, Siemens, Trident Gum, Unilever and Xyrofin. Lecturers will be invited to a reception, given in their honor by Colgate, a small token of our gratitude for their time and effort. Programs such as Live Television and Hands-on Courses and even Table Clinics could definitely not take place without the assistance of corporations and individuals committed to making a tangible contribution.

In another area of the Congress, we are pleased to welcome the participation of Nobelpharma as the major sponsor of the Opening Ceremony, an event that augurs as the best in FDI history and we appreciate the generosity of Ash Temple who will underwrite part of the International Evening, a reception planned as a perfect complement to the Opening Ceremony.

Those of you who have registered before January 31st will be invited to a hearty Western Breakfast by Aurum Ceramic who also shares in offering you an unforgettable golf day. Many draws will take place during the Congress and by registering and attending the Congress you could be eligible to win a luxurious Volvo, a classic Harley Davidson (provided by Aurum Ceramic) or two tickets to FDI 1995 in Hong Kong (from Nobelpharma).

The congress kits that you will receive on-site will be made available through the support of Oral-B, a company that has also provided incentives to entice your American colleagues to register for FDI 1994 at various American Dental meetings. Finally, exhibitors and sponsors have contributed to raising the awareness of FDI 1994 on a worldwide scale by distributing Congress material through their national, regional and international offices.

We say a sincere thank you to all our sponsors (a complete list can be found on the following page) and invite other companies to share in making FDI 1994 the international dental meeting of the year, a must-attend event for every member of the dental team!

In order to make it easier for all our participants to satisfy their continuing education needs, attendance will be verified at every lecture. We look forward to welcoming you to Vancouver this October 2 - 8.

Michel Jahjah, D.D.S.
General Chairman
FDI 1994 Organizing Committee
c/o Canadian Dental Association
1815 Alta Vista Drive
Ottawa, Ontario K1G 3Y6

Tel.: 1-800-267-6354
Fax: (613) 523-3062



Congress-at-a-glance

OCTOBER 2 SUNDAY	OCTOBER 3 MONDAY	OCTOBER 4 TUESDAY	OCTOBER 5 WEDNESDAY	OCTOBER 6 THURSDAY	OCTOBER 7 FRIDAY	OCTOBER 8 SATURDAY
PRE-CONVENTION COURSES (LIMITED ATTENDANCE)		LECTURES, LIVE TV PRESENTATIONS, HANDS-ON COURSES, POSTER PRESENTATIONS AND TABLE CLINICS FOR DENTISTS, ASSISTANTS, HYGIENISTS, TECHNICIANS AND OFFICE PERSONNEL				POST- CONVENTION
	OPENING CEREMONY	DENTAL TRADE EXHIBITION				
DINNER CRUISE	INTERNATIONAL EVENING	CHINESE EVENING	SALMON BARBECUE	FDI BALL		
	VISITS AND ONE DAY TOURS, ACCOMPANYING PERSONS' PROGRAM, CHILDREN'S PROGRAM					TOUR
PRE- CONGRESS TOURS	FDI BUSINESS MEETINGS FROM SEPTEMBER 29TH TO OCTOBER 8TH					POST- CONGRESS TOURS

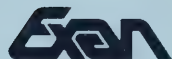


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Pre-Registration Deadline

The pre-registration deadline (May 15th) for the FDI '94 World Dental Congress is fast approaching! Those who wish to take advantage of the reduced registration fees must send in their enrolment forms to arrive at the FDI 1994 Organizing Committee office, c/o Canadian Dental Association, prior to May 15th. Enrolment forms that arrive after this date will be accepted, however, the convention registration fees will have increased.



MAY 1994

SUN	MON	TUES	WED	THURS	FRI	SAT
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

A reminder that many of the courses being offered at the Congress have limited capacity and are assigned on a first-come, first-served basis. Also, hotel accommodation availability is decreasing daily; if you require a hotel reservation send it in immediately!

We look forward to welcoming you to Vancouver this fall. For your convenience, we have enclosed an additional enrolment form with this issue of the *CDA Journal*.

Take advantage of the full range of events being offered at the 82nd World Dental Congress and register today!

SCIENTIFIC PROGRAM

Lectures & Symposia: Included with your enrolment to the Congress

- **The Role of Micro-organisms in Periodontitis**
Jean-Pierre Ouhayoun (France)
- **New Diagnostic Tools**
Roy Page (U.S.A.)
- **Treatment Modality Update**
Mariano Sanz-Alonzo (Spain)
- **Fluorides — What's New?**
Stephen H.Y. Wei (Hong Kong)
- **Anti-Plaque Agents and Antimicrobial Agents — Clinical Applications**
Philip Marsh (United Kingdom)
- **Infection Control — The Current Global Status**
Jens Pindborg (Denmark)
- **Occupational Infectious Disease and the Challenge of Infection Control**
John Molinari (U.S.A.)
- **Quality Assurance in Patient Care, Choosing Products and Recommending Procedures**
Martin Addy (Wales)
- **Role of ADA Product Evaluation Programs**
Kenneth Burrell (U.S.A.)
- **Assuring Quality of Dental Health by Obtaining Equivalency of Dental Diplomas**
Pierre Colombet (France)
- **Quality Assurance — The Role of the FDI**
Erik D. Olsen (U.S.A.)
- **The New Business of Dentistry**
James Pride (U.S.A.)
- **The Un(Happy) Complete Denture Patient**
Glen McGivney (U.S.A.)
- **Prosthetic Aspects of Osseointegrated Implants**
George Zarb (Canada)
- **What's Old... What's New... What's Tried... What's True... New Instruments for Dental Professionals**
Sherry Burns (U.S.A.)
- **Current Concepts on Oral Precancer**
Jens Pindborg (Denmark)
- **Early Orthodontic Management of Significant Skeletal Discrepancies**
Donald Joondeph (U.S.A.)
- **CAD/CAM for Dental Restorations**
Diane Rekow (U.S.A.)
- **Ethics and Professionalism in a Revolutionary Age**
Muriel J. Bebeau (U.S.A.)
- **Acute Dental Emergencies**
Raymond S. Greenfeld (Canada)

- **Facial Imaging**
Gerald Wittenberg (Canada)
- **Total Patient Care in Pediatric Dentistry**
Stephen H.Y. Wei (Hong Kong)
- **Diseases of the Tongue — a Clinical Overview**
Isaac Van Der Waal (The Netherlands)
- **The Use of Biomaterials as Bone Substitutes in Periodontology and Implantology**
Jean-Pierre Ouhayoun (France)
- **Vasopressors and Heart Disease**
Stanley Malamed (U.S.A.)
- **Early Diagnosis and Treatment of Precancerous Lesions**
Isaac Van Der Waal (The Netherlands)
- **Employee Satisfaction — What Makes a Great Dental Team**
James Pride (U.S.A.)
- **Involving your Staff in Patient Communication**
Jennifer de St-Georges (U.S.A.)
- **The Missing Link in Dentistry**
Walter Hailey (U.S.A.)
- **Dental Hygiene — Recall Redefined**
Annette Linder (U.S.A.)
- **Understanding Procedures and Economics of Infection Control**
John Molinari (U.S.A.)
- **Update on Infectious Disease in Dentistry**
Sol Silverman Jr. (U.S.A.)
- **Temporary Fixed Partial Denture Restoration**
Pierre Boudrias (Canada)
- **The Wonderful World of Glass Ionomer Cements**
Graham Mount (Australia)
- **Bleaching and Porcelain Laminate — The Natural Combination**
Ronald Feinman (U.S.A.)
- **Ecological Approaches for the Control of Dental Plaque**
Philip Marsh (United Kingdom)
- **Theory of Computerization**
Ted De Vries (Canada)
- **Update on Premalignant Lesions and Oral Cancer**
Sol Silverman Jr. (U.S.A.)
- **The Spark of Erosion Technique (Procera) — Clinical Applications in Conventional and Implant Dentistry**
Pierre Boudrias (Canada)

- **Everything New is Old Again**
Dennis C. Smith (Canada)
- **Restorative Prosthodontics — Techniques for Improved Esthetics and Function**
Craig K. Naylor (Canada)
- **Biocompatibility of Dental Materials**
Dennis Smith (Canada)
- **Does Bonding Survive?**
Karl-Johan Soderholm (Sweden)
- **Caries Inhibition by Xylitol Chewing Gum**
Jason Tanzer (U.S.A.)
- **The Action of Xylitol on Mutans Streptococci — Is There Any Clinical Significance in Preventive Dentistry**
Luc Trahan (Canada)
- **Xylitol Programs in Child Populations with Advanced Untreated Caries**
K. Mäkinen (USA)
- **Creating a Patient-Centered Practice by Developing a Solid Patient-Practice Relationship**
Jennifer St.-Georges (U.S.A.)
- **The Oral Management of Cancer Patients**
Joel Epstein (Canada)
- **Bruxism — Controversy and Therapeutic Techniques**
Gilles Lavigne (Canada)
- **Removable Partial Denture — The Future**
Claude Lamarche (Canada)
- **Construction Without Destruction — Clinical Consequences of Porcelain Bonded to Tooth Structure**
Sverker Toreskog (Sweden)
- **WHO Program — Delivery of Oral Health Care**
- **Focus on Tax Planning for the Future**
Thomas H. Olson (Canada)
- **Cosmetic Dentistry/Cosmetic Imaging — "New Vistas in Communication"**
Ken Neuman (Canada)
- **Infant Dental Care**
Stephen Moss (U.S.A.)
- **Traumatic Injuries of the Trigeminal Nerve — Causes, Diagnosis, Treatment and Prevention**
Domenico Morielli (Canada)
- **Why Does Complete Denture Treatment Fail?**
Claude Lamarche (Canada)
- **Aesthetic Dentistry — Bonding with Composites and Ceramics**
James Dunn (U.S.A.)

SCIENTIFIC PROGRAM



Different Types of Lasers and Their Use

Ferry Myers (U.S.A.)

Mechanism of Cardiovascular and Neuroendocrine Responses During Stress in Different Types of Dental Treatment

H.S. Braud (The Netherlands)

Malocclusions

Donald Woodside (Canada)

Recent Prosthetic Advances in Osseointegration

Torsten Jemt (Sweden)

In Vivo/In Vitro Evaluations of Dental Composites

Karl-Johan Soderholm (Sweden)

Medical Emergencies: Is Trouble Coming?

L. Abraham-Impijn (The Netherlands)

Medical Emergencies in the Dental Office — How to Handle it

Yuzuru Kaneko (Japan)

Caries Risk Assessment

J.D.B. Featherstone (U.S.A.)

Practical Use of Fluorides for Caries Control

George K. Stookey (U.S.A.)

Guided Tissue Regeneration — Absorbable vs. Nonresorbable Membranes

Roland M. Meffert (U.S.A.)

A New Era of Patient Education and Case Acceptance

Anita Jupp (Canada)

Biomaterials and Restorative Dentistry Techniques

Denis Robert (Canada)

A Technique and Management Approach to Restorative and Esthetic Dentistry

Michael Goldfogel and Allen Kincheloe (U.S.A.)

The Success of Oral Appliances in the Treatment of Sleep Apnea and Snoring

L.W. Halstrom and A. Lowe (Canada)

Oral Surgery for the General Practitioner

Peter Reichart (Germany)

Change — An Essential Part of Practice Growth

Anita Jupp (Canada)

The Cast Gold Restoration in General Practice

Richard V. Tucker (U.S.A.)

Infection Control in Dentistry — 1994

James A. Cottone (U.S.A.)

The preliminary scientific program is subject to change as other lectures are added.

Hands-on Courses

An opportunity to handle material, equipment and instruments while practicing new techniques under the supervision of an expert (Limited attendance)

- **Removable Partial Denture**
Glen McGivney (U.S.A.)
- **Isn't it About Time to Get on the Cutting Edge?**
Sherry Burns and Nancy Knispel (U.S.A.)
- **Dental Radiography**
Pat Robertson et al (Canada)
- **Root Planing and Scaling**
Herbert I. Bader (U.S.A.)
- **Cardio-pulmonary Resuscitation**
St. John's Ambulance (Canada)
- **Computers — Up Close and Personal**
Ted De Vries (Canada)
- **Endodontics for the 90's — Flare, File, Fill**
Howard Martin (U.S.A.)
- **How to Choose and How to Use the Newest Curettes — Periodontal Instrumentation Workshop**
Sherry Burns and Nancy Knispel (U.S.A.)
- **Esthetic Dentistry 1994**
Michael Goldfogel and Allen Kincheloe (U.S.A.)
- **Dental Electrosurgery for the 90's**
Jeffrey Sherman (U.S.A.)
- **Dental Materials for Dental Assistants**
Alan Boghosian (U.S.A.)
- **Recent Prosthetic Advances in Osseointegration Ad Modum Branemark**
Torsten Jemt (Sweden)
- **Provisional Restorations — Two User Friendly Restorative Techniques**
Keith Rossein (U.S.A.)

Limited Attendance Courses

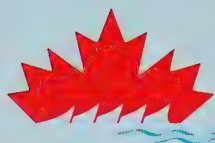
Benefit from sustained lecturing, discuss different treatment procedures and thoroughly review specific cases.

- **Pain and Fear and the Future of Dentistry**
Stanley Malamed (U.S.A.)
- **Aesthetic Restorative Procedures, How, When and Why**
Ronald Feinman (U.S.A.)
- **Recession Proof your Practice — Strategies for Minimizing the Effects of Economic Downturn**
Clyde L. Schultz (U.S.A.)
- **Aesthetic Restorative Dentistry and Materials Update**
Terry Donovan (U.S.A.)
- **Periodontics for the 1990's and Beyond**
Roy Page (U.S.A.)

Live Television Presentations

View live demonstrations via giant screen TV plus get an opportunity to ask questions as the clinician performs procedures on patients.

- **Osseointegrated Implants for the Partially Edentulous Patient**
Peter Stevenson-Moore (Canada)
- **Porcelain Veneering Made Easy**
Terry Donovan (U.S.A.)
- **Guided Tissue Regeneration**
- **Hand and Powered Root Instrumentation**
Herbert I. Bader
- **Chairside Tooth Preparation for Veneer Onlays**
Werner H. Mormann (Switzerland)



FDI
1994

Scientific Program

COME AND SHARE YOUR KNOWLEDGE ...

Table Clinics, Free Communications and Poster Presentations

Presenting a table clinic, free communication or poster presentation is a rewarding way for clinicians to share their knowledge, research and their own personal experience. These presentations are generally focused on a specific topic of interest or concern to the dental profession and presented in a condensed manner.

Those interested in presenting a table clinic, free communication or poster presentation will need to send in Enrolment Form B along with their FDI Congress registration. Enrolment Form B is attached to the participant enrolment forms found in the centre pages of the *Preliminary Program* or can be obtained by calling the FDI 1994 Organizing Committee at 1-800-267-6354.

Along with their entry form, a clinician will need to submit an abstract of their presentation. This abstract will be reviewed by the Organizing Committee and will be the basis upon which the selection process is made.

This year Unilever Research will be sponsoring a contest for all table clinic entries. First Prize is US \$3000 and a solid silver salver. Second prize is US \$2000 and third prize is US \$1000.

Simultaneous Interpretation

To truly make FDI '94 international, simultaneous interpretation will be available for many lectures in the official languages of the Congress: French, German, Spanish and a few in Japanese. All of the live-television sessions will be simultaneously interpreted for participant viewers. As well, all lectures highlighted in blue in the *Preliminary Program* will also have simultaneous interpretation. Language barriers will be broken as dental professionals from all corners of the world have the opportunity to learn together.

— A —
(\$170 - \$210)

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- ☐ Four Seasons Vancouver
- ☐ Hyatt Regency
- ☐ Le Meridien
- ☐ Pacific Palisades - Shangri-La Intl.
- ☐ The Pan Pacific (FDI **SOLD OUT** N.G.)
- ☐ The Vancouver Renaissance Harbourside
- ☐ Hotel Vancouver
- ☐ Waterfront Centre (CDA **SOLD OUT** N.G.)
- ☐ Wedgewood
- ☐ The Westin Bayshore

— B —
(\$125 - \$155)

- ☐ The Coast Plaza at Stanley Park
- ☐ Delta Pacific Resort & Conference Centre
- ☐ Delta Vancouver Airport & Marina
- ☐ The Georgian Court
- ☐ Holiday Inn Vancouver - Downtown
- ☐ The Landis
- ☐ Listel O'Douls
- ☐ Lonsdale Quay Hotel
- ☐ Wall Centre Plaza Hotel
- ☐ Sheraton Landmark

— C —
(\$100 - \$120)

- ☐ The Century Plaza Hotel
- ☐ Chateau Granville
- ☐ The Coast Vancouver Airport
- ☐ The Executive Inn
- ☐ Holiday Inn Vancouver Centre
- ☐ Hotel Georgia
- ☐ Parkhill
- ☐ Radisson President Hotel & Suites
- ☐ Sheraton Inn Plaza 500

— D —
(Up to \$99)

- ☐ Blue Horizon
- ☐ Burrard Motor Inn
- ☐ Days Inn Downtown
- ☐ Quality Inn Downtown
- ☐ Ramada Vancouver Centre
- ☐ Sandman
- ☐ Skyline Airport
- ☐ Stay 'n Save Motor Inn
- ☐ U. of British Columbia
- ☐ YWCA

There's no place like ... Vancouver in October!

The above hotels have been selected to house all Congress participants. These hotels offer a variety of rooms for all tastes and range in value from a mere \$80 to \$210.

Note that hotel occupancy in Vancouver between the months of May to October is over 90%. To ensure that you have accommodations, **do not delay** in sending in your hotel accommodation forms to FDI 1994 in our Ottawa office.

BE SURE TO MAKE YOUR RESERVATIONS TODAY!

**OUT and
ABOUT
in**

VANCOUVER



Attractions

There are many tourist attractions to fill your stay in Vancouver. The following Children's Programs, Visits & One-Day Tours and Social Programs have been organized for all Congress participants:



Fun and Adventurous Children's Program:

North Shore Excursion ♦ Science World/
Omnimax Theatre ♦ Vancouver Aquarium and
Stanley Park

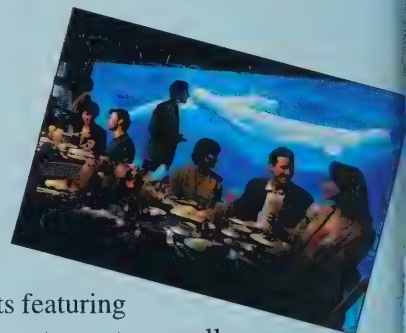


Visits & One-Day Tours:

Vancouver City Tour ♦ Salmon Fishing ♦ Scenic Harbour Cruise ♦ North Shore & Grouse Mountain ♦ Vancouver Aquarium: "Breakfast with the Whales" ♦ Vancouver City & Granville Island ♦ Royal Hudson Steam Train & Britannia Excursion ♦ Museum of Anthropology ♦ A Day in Victoria ♦ Whistler Mountain Day Trip

Social Program:

Opening Ceremony ♦ International Evening ♦ Scenic Evening Dinner Cruise ♦ Discover the Orient Evening ♦ Salmon BBQ/Logging Show ♦ FDI Ball



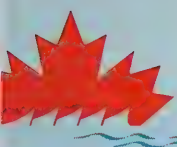
Dining Out

Vancouver's multicultural diversity and Pacific Rim position has created restaurants featuring dishes from all over the globe. Vancouver has several of the best authentic Chinese restaurants as well as fine Vietnamese, Indian, Italian, Thai, Korean and French cuisine. Vancouver chefs take advantage of fresh produce grown year-round and local seafood is often served straight from the ocean. In Vancouver, dining out often comes with a view. Diners can spend the evening at a restaurant on a mountainside overlooking the city and harbour, nestled in the heart of Stanley Park, or at a table by the ocean.



Shopping

Vancouver, with its unique cultural and ethnic diversity, offers a wide variety of exciting shopping opportunities. Native West Coast Indian arts and crafts are among the city's more unique artistic products. Also renowned are jade sculptures and jewelry, whalebone scrimshaw carvings and Cowichan Indian sweaters. Vancouver also offers high fashion clothing and jewelry boutiques found on Robson Street. For an alternative shopping experience, Vancouver has a number of public markets.



**FDI
1994**

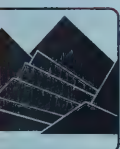
Pre and Post Congress Tours

ALASKA (September 24 - October 1, 1994)



A memorable 7 night cruise to Alaska aboard Holland America's M.S. Westerdam. Heading up the inside passage, enjoy many delightful ports of Ketchikan (Alaska's first city), Juneau (Alaska's capital) and Glacier Bay (where the mighty glaciers will take your breath away!). A trip of a lifetime!

CANADIAN ROCKY MOUNTAINS (October 8 - 11, 1994)



See the wonders of the Canadian Rocky Mountains on this 4 day/3 night train and bus excursion. Travel through spectacular scenery during the day and enjoy comfortable hotel accommodations at night. You will see a wide variety of wildlife and natural attractions that Alberta and British Columbia have to offer; including the wonderful destinations of Jasper, Banff and Lake Louise.

HAWAII (October 7 - 14, 1994)



Enjoy a fabulous 8 day/7 night vacation in Hawaii on the island of Oahu. You can stay at the Hilton Hawaiian Village or at the Pacific Beach Hotel, both situated on the beautiful Waikiki beach. A perfect tour for those wishing to relax and enjoy the magnificent view of Hawaii.

LOS ANGELES (October 10 - 13, 1994)



Enjoy a marvelous 4 day/3 night cruise aboard Holland America's M.S. Westerdam from Vancouver to Los Angeles along the Canadian and U.S. coast. Since the cruise departs on October 10th, this is the perfect tour for those wishing to do some post-conference sightseeing in Vancouver.

AUSTRALIA AND NEW ZEALAND (October 7 - 21, 1994)

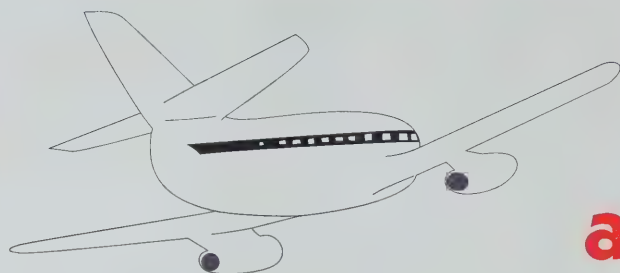


An incredible 15 day/14 night post-conference tour "down-under". In Australia, visit Cairns, the great Barrier Reef, the rain forests, Sydney, the Blue Mountains and go on a wine tour. In New Zealand, see the Coromandel Peninsula and Rotorua thermal springs. You will also have the opportunity to stay either on a sheep, kiwi fruit or cattle farm for two nights. Each farm will host 2 couples from our group – a sure way to enjoy local New Zealand hospitality. From here, optional stopovers for 4 days/3 nights in either Fiji or Hawaii.

For more detailed information,

contact the FDI 1994 Organizing Committee
at 1-800-267-6354 by telephone or at (613) 523-3062 by fax.

Travelling has never been made easier!



**Up, up
and Away!**

Air Canada and Continental Airlines have been appointed the Official Carriers of the FDI '94 Congress in Vancouver. In addition to the convenience of flying on Canada's leading airline, Air Canada is offering special convention rates for those travelling within North America. Also, you can earn valuable Aeroplan or Onepass miles that can be redeemed on any Air Canada or Continental route worldwide.

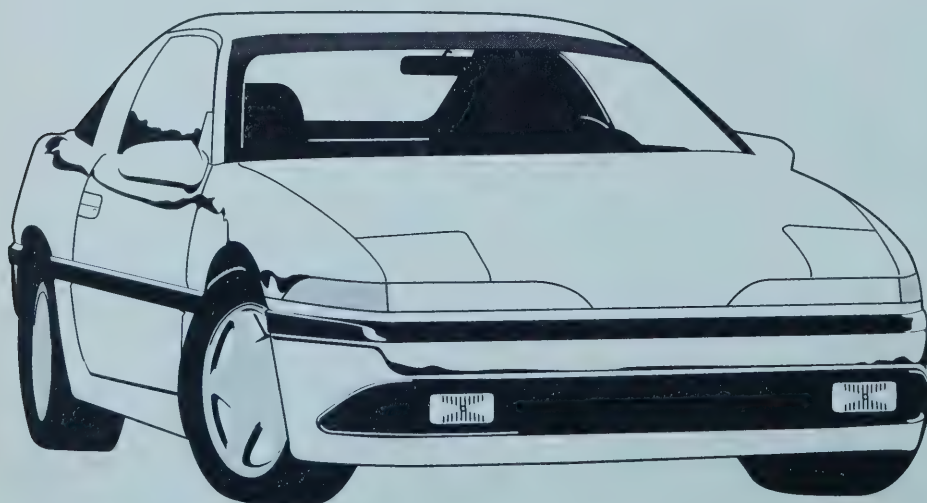
Take advantage of this valuable offer by calling your travel agent or Air Canada at 1-800-361-7585 (in Canada and the U.S).

When purchasing your ticket, please ask that our Event Number CV940017 be entered in the Tour Code box and note the Reference Code FDI in the Endorsement box, regardless of the fare purchased.

For participants outside of North America, contact the local Air Canada office for the best available fares.

Avis rent-a-car

Special low meeting rates from Avis, all with free unlimited mileage, can help you reduce the costs of car rental without sacrificing quality and give new meaning to the concept of "meeting budgets". As an added benefit, these low rates are good from one week before to one week after the FDI Congress.



TO RESERVE YOUR CAR, call Avis toll-free (Canada and the United States) 1-800-331-1600 and mention our Avis Worldwide Discount number #B712416. Participants from other countries should contact the local Avis reservation centres.

CDA LIBRARY

What's New In the Library This Month?

This month's library package features articles on dental impression materials. It is available to CDA members at a cost of \$5 (plus applicable taxes). To obtain your package, call 1-800-267-6354 or 613-523-1770, ext. 234, 270, or 271, or fax us at 613-523-6574. The package contains the following articles, located through a MEDLINE search:



Dental Impression Materials

1. Breeding, L.C. and Dixon, D.L. Compression resistance of four interocclusal recording materials. *J Prosthet Dent.* Dec. 1992; 68(6):876-8.
2. Chee, W.W. and Donovan, T.E. Polyvinyl siloxane impression materials: a review of properties and techniques. *J Prosthet Dent.* Nov. 1992; 68(5):728-32.
3. Christensen, G.J. Complex fixed and implant prosthodontics: making nearly foolproof impressions. *JADA.* Dec. 1992; 123(12):69-70.
4. DeWald, J.P. et al. Wettability of impression materials treated with disinfectants. *Am J Dent.* Apr. 1992; 5(2):103-8.
5. Fano, V. et al. Dimensional stability of silicone-based impression materials. *Dent Mater.* Mar 1992; 8(2):105-9.
6. Ferrari, M. and Balleri, P. Hydrocolloid impressions of multirooted teeth: a clinical report. *Quintessence Int.* Jan. 1993; 24(1):35-7.
7. Firtell, D.N. and Koumjian, J.H. Mandibular complete denture impressions with fluid wax or polysulfide rubber: a comparative study. *J Prosthet Dent.* Jun. 1992; 67(6):801-4.
8. Heisler, W.H. and Tjan, A.H. Accuracy and bond strength of reversible with irreversible hydrocolloid impression systems: a comparative study. *J Prosthet Dent.* Oct. 1992; 68(4):578-84.
9. Hogans, W.R., 3rd. and Agar, J.R. The bond strength of elastomer tray adhesives to thermoplastic and

acrylic resin tray materials. *J Prosthet Dent.* Apr. 1992; 67(4):541-3.

10. Hung, S.H. et al. Accuracy of one-step versus two-step putty wash addition silicone impression technique. *J Prosthet Dent.* May 1992; 67(5):583-9.

11. Inturregui, J.A. et al. Evaluation of three impression techniques for osseointegrated oral implants. *J Prosthet Dent.* May 1993; 69(5):503-9.

12. Lambert, R.J. No muss, no fuss irreversible hydrocolloid impressions. *J Prosthet Dent.* Dec. 1992; 68(6):983.

13. Lim, K.C. et al. Effect of operator variability on void formation in impressions made with an automixed addition silicone. *Aust Dent J.* Feb. 1992; 37(1):35-8.

14. McNeill, M.R. et al. Disinfection of irreversible hydrocolloid impressions: a comparative study. *Int J Prosthodont.* Nov.-Dec. 1992; 5(6):563-7.

15. Merchant, V.A. Update on disinfection of impressions, prostheses, and casts. ADA 1991 guidelines. *J Calif Dent Assoc.* Oct. 1992; 20(10):31-5.

16. Ness, E.M. et al. Accuracy of the acrylic resin pattern for the implant-retained prosthesis. *Int J Prosthodont.* Nov.-Dec. 1992; 5(6):542-9.

17. Rueggeberg, F.A. et al. Sodium hypochlorite disinfection of irreversible hydrocolloid impression material. *J Prosthet Dent.* May 1992; 67(5):628-31.

18. Saunders, W.P. et al. Effect of impression tray design upon the accuracy of stone casts produced from a single-phase medium-bodied polyvinyl siloxane impres-

sion material. *J Dent.* June 1992; 20(3):189-92.

19. Sydiskis, R.J. and Gerhardt, D.E. Cytotoxicity of impression materials. *J Prosthet Dent.* Apr. 1993; 69(4):431-5.

20. Tan, H.K. et al. Effects of disinfecting irreversible hydrocolloid impressions on the resultant gypsum casts: Part 1 — Surface quality. *J Prosthet Dent.* Mar. 1993; 69(3):250-7.

21. Tjan, A.H. et al. Effect of tray space on the accuracy of monophasic polyvinylsiloxane impressions. *J Prosthet Dent.* July 1992; 68(1):19-28.

22. Waldmeier, M.D. and Grasso, J.E. Light-cured resin for post patterns. *J Prosthet Dent.* Sep. 1992; 68(3):412-5.

Aquisitions

1. Canada. Health Protection Branch. Environmental Health Directorate. Radiation Protection in dental practice, recommended safety procedures for installation and use of dental X-ray equipment : safety code — 22. Minister of National Health and Welfare. : c1981.
2. Garber, D.A. and Goldstein, R.E. Porcelain and composite inlays and onlays : esthetic posterior restorations. Quintessence Int. : c1994.
3. Kaban, L.B. Guest ed. Oral and maxillofacial surgery in children and adolescents. Oral and maxillofacial surgery clinics of North America. Feb. 6(1), WB Saunders : 1994.
4. Miles, D.A. and Van Dis, M.L. Guest eds. The clinical approach to radiologic diagnosis. Dental clinics of North America. Jan. 38(1), WB Saunders : 1994.
5. Miletich, J.J. AIDS: A multimedia sourcebook. Greenwood Press : c1993.
6. Trieger, N. Pain control. 2nd ed. Mosby Year Book, Inc. : c1994.
7. Trowbridge, H. and Emling R. Inflammation : a review of the process. 4th ed. Quintessence Books : c1993.

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ANNOUNCEMENTS

NATIONAL HIGHLIGHTS

April 21-23

**Ontario Dental Association
Annual Spring Meeting**
(416) 922-3900

May 12-14, 1994

**Newfoundland Dental
Association Annual Convention**
(709) 579-2362

May 26-28, 1994

**PEI Dental Association
Annual Meeting**
(902) 566-5199

May 28-June 1, 1994

**23e Congrès annuel de l'Ordre
des dentistes du Québec, Les
journées dentaires du Québec,
Montréal, Qc**
(514) 875-8511
Fax: (514) 875-1561

May 29-June 1, 1994

**Alberta Dental Association
Annual Meeting**
Contact: Dr. Kearns
(403) 253-6602

June 2-4, 1994

**College of Dental Surgeons of
Saskatchewan**
Contact: Dr. Bruce Albert
(306) 693-0755

June 3-4, 1994

**Nova Scotia Dental Association
Annual Meeting**
(902) 420-0088

June 10-11, 1994

**New Brunswick Dental Society
Annual Meeting**
(506) 452-8575

October 2-8, 1994

**Joint CDA/FDI
Annual Dental Meeting**
Vancouver, BC
(613) 523-1770,
or 1-800-267-6354

May/Mai 1994

**May 14: Alberta Academy of Peri-
odontology** is holding a continuing
education course entitled *Current
Concepts in Periodontics*. For infor-
mation, contact: Dr. Albert
Frydman, (403) 288-3334.

**May 22-28: International College
of Dentists Annual Meeting —
European Section** at the Jerusalem
Hilton Hotel in Jerusalem. For de-
tails, contact: Dr. S. Sussman, Sec-
retariat, ICD European Section,
P.O. Box 50006, Tel Aviv 61500,
Israel.

June/Juin 1994

**June 2-5: The 4th Singapore Inter-
national Dental Exhibition & Con-
ference** in Singapore. For infor-
mation contact Orchard Dental Cen-
tre Pte. Ltd., 268 Orchard Road
#05-07, Singapore 0923, Tel.: (65)
734 3162

**June 2-4: Academy for Sports Den-
tistry** meeting in Pittsburgh, Penn-
sylvania. For information, contact:

Dr. A.W.S. Wood, 1553 Randor
Dr., Mississauga, Ontario, L5J 3C6.
Tel: (905) 823-2008.

**June 6-10: 12th National Congress
on Dentistry (Latin-American
Meeting on Dentistry)** at the Ha-
vana International Conference
Center in Havana, Cuba. For more
information, write: Palacio de las
Convencios, Apartado 16046. La
Habana, Cuba.

**June 6-17: Pindborg Course in
Oral Pathology** given on the prem-
ises of the Danish Dental Associa-
tion in Copenhagen, Denmark. For
more information, contact: Anne
Grethe Ingversen, Secretary, Dept.
of Oral Pathology, School of Den-
tistry, University of Copenhagen,
20 Norre Allé, DK-2200 Copenha-
gen N, Denmark.

**June 20-26: Expodental 94 —
Turkish Dental Association Sec-
ond International Dental Congress**
in Istanbul, Turkey. For infor-
mation, contact: Istanbul Chamber of

Dentists, Mesrutiyet Cad. 182/7
Sishane, Istanbul, Turkey.

**June 25-July 1: 10th Congress of
the International Association of
Dento-Maxillo-Facial Radiology** in
Seoul, Korea. For information, con-
tact: Congress Secretariat, 10th
IADMFR, c/o Korea Convention
Services Ltd., SL Youngdong P.O.
Box 305, Seoul 135-603, Korea.

August/Août 1994

**August 18-20: Bone Augmentation
and Tissue Guidance, two-day im-
plant seminar** presented jointly by
the Vancouver Implant Seminar
(Study Club) and the Canadian So-
ciety of Oral Implantology in Van-
couver, B.C. For information, con-
tact: Vic, Barry or Linda at (604)
298-4232.

**August 18-20: Atlantic Provinces
AGD Annual Convention** in Bru-
denell, P.E.I. Speakers: Robin
Wright (Interoffice Communica-
tions) and Dr. Michael Horsman
(Pharmacology Update). For infor-
mation, contact: Dr. Richard
Holden at (902) 566-5133 or Dr.
Jack Thompson at (506) 847-4243.

**August 24-28: The Canadian
Academy of Endodontics — 30th
Annual Meeting** in Kananaskis, Al-
berta. For information contact: Dr.
K. Fuhrman, Suite 260, Bankers
Hall, 315-8th Avenue S.W., Cal-
gary, Alberta T2P 4K1 - Tel.: (403)
263-1343

September/Septembre 1994

**September 8-13: 32nd Iranian An-
nual Dental Association Congress
and 12th International Dental Ex-
hibition** in Teheran, Iran. For infor-
mation, contact: A.H. Arfaei, Ir-
anian Dental Association, P.O. Box
14155 — 3695 IR — Teheran, Iran.

**September 14-18: 17th Biennial
Conference of the New Zealand
Dental Association** in Christ-
church, New Zealand. For infor-
mation, contact: N.Z.D.A. Biennial

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Conference Committee, P.O. Box 1183, Christchurch, New Zealand.
September 24-25: 11th International Oral Implant Symposium in Bali, Indonesia. For more information call: (65) 734 3162

October/Octobre 1994

October 7: Canadian Academy of Pediatric Dentistry in Vancouver, B.C. For information contact: Dr. Ian Bennett, Executive Director, Canadian Academy of Pediatric Dentistry, 4095 Puget Drive, Vancouver, B.C. V6L 2V3. Tel: (604) 733-7976 or Fax: (604) 733-7996.

October 24-28: Turkish Society of Restorative Dentistry's 2nd International Congress in Istanbul, Turkey. The main topic is "Lasers in dentistry" (Simultaneous interpretation between English and Turkish will be provided). For information, contact: Mete Üçok, University of Istanbul, Faculty of dentistry, 34390 Capa, Istanbul, Turkey.

October 31-November 5: Joint Meeting of the Canadian Society of Forensic Science & Northwest Association of Forensic Scientists at the Waterfront Hotel in Vancouver, British Columbia. For information, contact: Jeffrey Caughlin, R.C.M.P. Forensic Laboratory, 5201 Heather Street, Vancouver, B.C. V5Z 3L7. Tel: (604) 264-3507, Fax: (604) 264-3499.

November/Novembre 1994

November 22-25: Congrès de l'Association Dentaire Française in Paris, France. For information, contact: Dr. Alain Deyrolle, 92 Avenue de Wagram, 75017, Paris, Tel.: (1) 42 27 89 00.

November 22-25: XIIIth International Dental Film and Video Festival in Paris, France. For information, contact: Dr. Maurice Dolovici, Secrétaire Général, Association Dentaire Française, 92 avenue de Wagram, F-75017 Paris, France.

Continuing Education 1994

University of Western Ontario

May 5-7: Complete Dentures

This course will stress the anatomical and physiological considerations that influence complete denture therapy, the influence of oral function on clinical procedures and the inter-relationship between dentist and dental laboratory technician that is necessary for successful treatment.

May 14: Infectious Diseases and Infection Control

The objectives are to discuss the changing pattern of infectious diseases and provide an overview of infectious diseases of concern in the dental office.

June 10: Clinical Periodontics for Dentists and Dental Hygienists, Part I

Consists of a one-day didactic program on the identification and treatment of periodontal disease. Part I is a prerequisite for Part II.

June 11 & 18: Clinical Periodontics for Dentists and Dental Hygienists, Part II

The second day of the course will consist of lectures, laboratory exercises and a participation clinic.

June 16-18: Management Hypnosis

Guest Lecturers: Drs. R. Mulligan, U.S.C., California, and S. Finkelstein, New York. The three-day workshop will cover a brief history and theory of hypnosis.

June 17: Oral Pathology and Oral Radiology

This course is designed for the general dentist and specialist wishing to improve their diagnostic skills.

For information contact:

Najet Hassan
Office of Continuing Dental Education
University of Western Ontario
Faculty of Dentistry, C.D.E.
Room 1003, Dental Sciences Building
London, Ontario
N6A 5C1

Tel: (519) 661-3902

Fax: (519) 661-3875

Dalhousie University

May 7: Periodontal Therapy — Art and Science

This course is designed to bridge the gap between traditional therapy and therapy related to current research.

May 14: Perspectives in Modern Endodontic Therapy

(Shimon Friedman, DMD, Dip. Endo.)

This program will outline the scope of endodontic therapy as it is perceived today.

May 28: Treatment Options for the Partially Edentulous

(Crawford Bain, BDS, DDS, Cert. Perio., Cert. Pros., M.Ed.)

This course is designed as a review of all current treatment options in the various partially-edentulous situations that present in general practice.

For information contact:

Continuing Dental Education
Faculty of Dentistry
Dalhousie University
Halifax, Nova Scotia
B3H 3J5

Tel: (902) 494-1674

Fax: (902) 494-2527

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Continuing Education 1994

Thunder Bay Dental Association
July 22-23: Endodontics
 (Dr. Herb Schilder)

October 21-22: Oral Pathology
 (Dr. Dick Elzay)

For information contact:

Endodontics
 Dr. Don Chorkawy
 Tel: (807) 345-0727
 Oral Pathology
 Dr. Wm. E. Turner
 Tel: (807) 623-9445

University of Toronto

May 5-7: Orthodontics for the General Practitioner

This course is offered under the direction of Dr. G. Altuna, associate professor, department of orthodontics, faculty of dentistry, University of Toronto.

May 6: Participation Course in Root Canal Filling using the "Warm Gutta Percha Technique"

The program is designed to present advances in endodontic practice to specialists in endodontics and to general dentists with considerable experience or interest in this field.

May 13: Clinical Restorative Dental Materials

Information will be presented to aid in the selection and use of a wide-range of restorative dental products and techniques. Guest speaker: Dr. Glen H. Johnson.

May 26-27: The Treatment of Partially Edentulous Patients with Osseointegrated Implants

Two separate but interrelated courses seek to provide the general dentist and the specialist with a sound and prudent body of information to determine the opti-

mal employment of implant prosthodontic prescriptions.

May 28: Dental Hygiene: Professional Exploration Day

This program has been developed by Mai Pohlak and Beverley Kassirer, in connection with the B.Sc.D. (Dental Hygiene) program at the Faculty of Dentistry, University of Toronto.

June 3: Planning Quality Treatment for Dentistry Today

This symposium will present an overview on the interrelations among the disciplines of periodontics, prosthodontics, restorative dentistry and orthodontics in the overall treatment planning for dentistry today.

June 17-18: Preventive Dentistry Forum

Home Care Products and Office Procedures for the Preventive-oriented Dental Practice — a two day "Forum in Preventive Dentistry."

October 20-21: The Current Treatment and Management of T.M. Disorders

This program is developed by Dr. George Zarb, professor and head of the prosthodontic department, faculty of dentistry, University of Toronto.

November 24-26: Nitrous Oxide in Dental Practice

This 17-hour course introduces the dentist — and indeed the entire health care team — to the concept of conscious sedation for the effective and efficient practise of dentistry.

For information contact:

Office of Continuing Dental Education
 Faculty of Dentistry
 124 Edward Street
 Toronto, Ontario
 M5G 1G6
 Tel: (416) 979-4902, Ext. 4503
 Fax: (416) 979-4936

Faculty of Dentistry General Practice Residency Training Program The University of British Columbia

Three teaching hospitals affiliated with the University of British Columbia, The Vancouver Hospital and Health Sciences Centre, B.C.'s Children's Hospital, and the B.C. Cancer Agency, together offer seven positions in a one-year dental residency program commencing each June and July. Clinical and didactic experience is offered in most dental disciplines.

Candidates must satisfy the requirements of the College of Dental Surgeons of B.C. for registration as well as those of the Department of Immigration, Government of Canada. Graduates of foreign dental schools must possess the National Dental Examining Board of Canada certificate.

Stipends are provided. Fringe benefits include uniforms, 20 days of vacation, plus medical and dental plans. Membership in the Professional Association of Residents and Interns is required.

Residents are registered as students of the University of British Columbia and with the College of Dental Surgeons of B.C., for which separate fees are paid.

The deadline for the receipt of applications is November 1 for entry to the program the following year. Selection of residents is based on application information, transcripts and reference letters. Personal interviews are also required.

Enquiries regarding the program and requests for application forms can be addressed to:



Director
 General Practice Residency Training Program
 Faculty of Dentistry
 Department of Oral Medical and Surgical Sciences
 The University of British Columbia
 2199 Wesbrook Mall, Vancouver, B.C. V6T 1Z3



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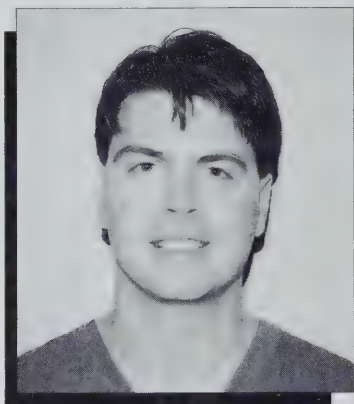
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STUDENT'S FORUM



Funding for Mandatory NDEB Examination

Mandatory National Dental Examining Board (NDEB) testing of Canadian dental school graduates will begin this year, requiring each candidate to write a 300-question multiple-choice examination. A practical examination, the OSCE (Objective Structured Clinical Examination), will be tested next year as well.

Canadian dental students have already voiced their concerns about the value of mandatory testing for licensure, and feel that this new requirement is redundant and unnecessary.

In 1993, Canadian dental graduates were required to pay \$490 to obtain their NDEB certificate. At this point in time, it is our understanding that 1994 graduates will be required to take the NDEB written examination (300 M.C.Q.) and that the OSCE examination will be tested. There will be no direct cost to graduating students in 1994 for this additional testing. However, the actual cost of the examination process has been tentatively estimated to be \$700, which would increase the cost of NDEB certification to approximately \$1,200, when and if this additional testing becomes mandatory.

Students unanimously agree that this additional fee would impose yet another financial burden on them at a time when cash flow problems are at their greatest. This is particularly true when the other costs faced by students — licensing fees, insurance, and in many cases

relocation expenses — in addition to the reduced demand for dental manpower in urban areas, are taken into account. Furthermore, most dental students leave school with a sizeable debt. According to Dr. R.E. McDermott of the University of Saskatchewan, College of Dentistry, over half of the 1993 dental graduates will be burdened with a total debt of at least \$45,000.

Mandatory NDEB testing may bring uniformity to the licensing process in all Canadian provinces, which would be a positive step. Canadian dentists should have greater accessibility to jobs anywhere in Canada. And, in fact, if all 10 provinces accept the NDEB examination for licensure, it would allow national portability of dentists. However, if complete portability cannot be guaranteed by the new system, there is yet another reason to question its introduction.

The introduction of testing will also provide some visible reassurance that Canadian dental school graduates are adequately trained to provide safe and prudent dental care — as the product, not the process, will be tested.

Although there have been no demonstrated problems with the current system of licensure, which is based on certification of graduates of accredited programs, testing will provide the licensing boards with the visible assurance they appear to be seeking. Therefore, it would be appropriate for the cost of the new examinations to be shared by the licensing bodies,

through licensing fees. A two per cent increase in fees (approximately \$20 per licensed dentist) would cover the administration costs of the examination.

If the licensing bodies agree that mandatory testing of Canadian graduates is the ultimate requirement, the responsibility of sponsoring the examination should rest with them. Canadian dental students, in accepting the policy of further examination, feel that since the profession as a whole will undoubtedly benefit from this new policy, funding should be co-operative as well.

Canadian dental students look to both the provincial dental boards and the profession for support. As evidenced by the high enrolment in CDA student membership at all schools, dental students keenly desire to be an integral part of the profession in Canada. In this time of decision, it is our hope that the Canadian Dental Association and its corporate members will continue their long-standing support of dental students by considering student concerns on this issue, thereby providing new graduates with another incentive to maintain an affiliation with their national association into practice life. ■

*A CDA Committee on
Student Affairs Position Paper
By Dr. Marco Chiarot
CDA Student Governor*

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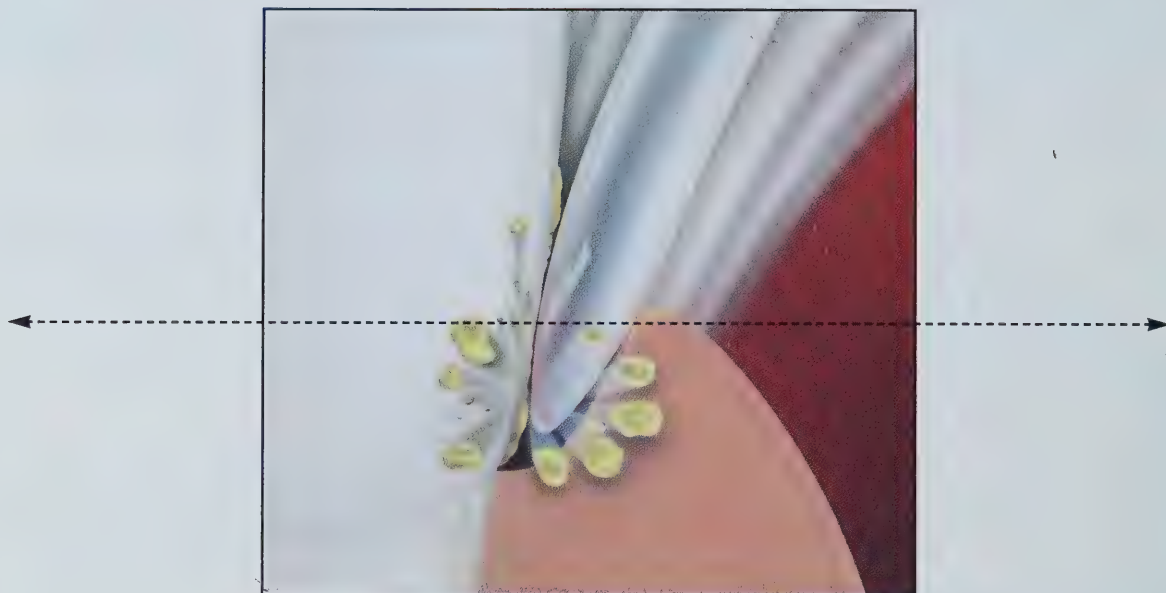
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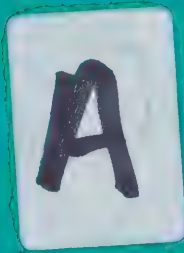


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Subscriptions: All subscriptions payable in advance in Canadian funds. In Canada - \$48 (+ GST); United States - \$53; all other - \$58.

Subscriptions are for 12 issues, not necessarily conforming with the calendar year.

Notice of change of address should be received before the 10th of the month, to become effective the following month.

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MAY/MAI 1994
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The *Journal of the Canadian Dental Association* is published in both official languages, except scientific articles, which are published in the language in which they are received. Readers may request the *Journal* in the language of their choice.

ISSN 0709 8936
PRINTED IN CANADA



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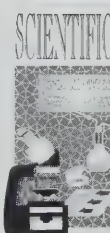
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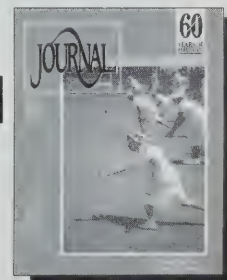
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Cover: The "Go-Go" generation at play — the number of geriatric patients seeking dental care is on the upswing.
(Photograph by Walter Pelech.)

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CDA members, look for your next issue of *Communiqué* in June.

LETTERS



Dr. James Coupland

What a pleasure it was to see the 1935 photograph of Dr. James Coupland and the reprint of his "Radiography In Dentistry" article in the January 1994 issue of the *Journal* (Celebrating 60 Years of Publishing. 60(1):8-9, 1994).

Many of us owe a great deal to Dr. Coupland for the training he provided, and above all, the example of excellence that he set for himself and demanded of others. He certainly practised what he preached: "The technical quality of the radiographs determines their value in diagnosis."

I hope the *Journal* is planning reprints from other pioneers. Would not the multiple achievements of Dr. Harry Garvin be worthy of comment, whether in his field of periodontics or in the field of dental journalism, not forgetting how on several occasions of grave financial crisis in the *CDA Journal*, he personally underwrote the printing costs.

Wallace F. Walford
Perth, Ontario.

Editor's Note

The *Journal* will continue to publish notable articles from 1935 as we continue to celebrate 60 years of publishing. The contributions of Dr. Harry Garvin, the founding editor, will be featured in the Diamond Jubilee issue in January 1995. The current editor however, makes no promises to underwrite printing.

AIDS and Dentistry

In her letter published in the March 1994 edition of the *Journal* (Aids and Dentistry. 60(3):177,

1994), Dr. Wood has identified the contradictions which exist in the "Florida Case." Quite correctly, she notes that a large volume of blood would be required to cause either an intentional or accidental route of transmission. On such a basis, she argues that an intentional route is as feasible as the politically-correct accidental transmission. However, there is no evidence that Dr. Acer inoculated his patients with a significant amount of blood either accidentally or intentionally. Therefore, in practical terms, both routes have no validation. That is why, in the article referred to by Dr. Wood, I suggested that alternative mechanisms for HIV acquisition among Dr. Acer's patients must be considered. In turn, this raises the idea that Dr. Acer may not have been the source of the infection.

In fact, there is no conclusive evidence which proves beyond doubt that Dr. Acer did infect his patients. Unless such proof is available he must be considered as innocent.

J. Hardie, BDS, M.Sc., FRCD(C)
Vancouver, B.C.

Taxation of Dental Benefits

Congratulations to the Canadian Dental Association on the advertisement placed in the *Globe & Mail* and other sources regarding a potential tax to be levied on dental plan benefits.

While this item did not appear in the budget, I nevertheless feel that your early intervention played a part in changing the government's mind.

Charles P. Daly, DDS
Newfoundland Dental Board

Patient Education and Case Acceptance

While I consider the greater part of the article by Ms. Jupp (A New Era of Dentistry: Patient Education and Case Acceptance. 60(3):193-195, 1994) important, there is one point in which I feel she has erred. As a retired dentist of some 40 years experience, I would respectfully suggest that if a dentist were to follow

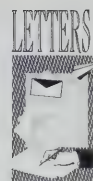
the regimen as suggested by Ms. Jupp in her article with reference to the new patient examination, then that dentist is not only doing the patient a disservice, but she or he has unconsciously developed a mind-set in the particular patient which is not conducive to acceptance of the suggested course of treatment.

The last thing a patient wants to hear immediately on entering a dental office for the first time is certainly not a review of office policies, more especially if that review deals with the monetary policies. The patient should be welcomed to the practice by someone at the front desk and escorted to the examination room which, preferably, should not look too "dental." The patient should be seated in a upright position by the assistant. The dentist should have been informed by some form of pre-arranged signal of the new patient's arrival, and should then excuse herself or himself for a few minutes from whatever she or he was doing and personally welcome the new patient, sitting at the same level, and having eye-to-eye contact. Having spent a few minutes in pleasant chit-chat, the dentist should inform the patient that she or he will be back in a short time, and that in the interim the assistant will explain the office policies and take their medical and dental history.

The office appointments should be scheduled so that the dentist is doing a procedure that can be left for a few minutes. If the assistant is a qualified preventive dental assistant (PDA), then the dentist should explain the role of the assistant in making a preliminary oral examination.

It is important that at this initial visit only two persons actually see the patient in the examination room. It would surprise many practising dentists if they were to talk to patients who go to a dental office for the first time and finish-up seeing the receptionist and the assistant and the dentist and a hygienist, and come away feeling they are on a production line.

The position of many dentists seems to be: "Now I have them here, let's get as much done as possible —



after all, time is money." It may be for this appointment, but it will not pay in the long run if the patient's trust is what we are seeking.

There is no such thing as wasted time in a dental office if that office is managed properly, and time that may not be spent with someone actually performing a dental procedure, is not, believe me, wasted time.

Mervyn J. Richards, DDS
Campbellcroft, Ontario.

A Waste of Eggs

It was with some disappointment that I received, with the March issue of the *Journal*, a document presumably purporting to set out an experiment, the purpose of which was to show how you can help lock in the calcium in an eggshell — and your teeth — by protecting them with fluoride toothpaste.

Apart from the atrocious wastage of eggs (we are invited to perform a few of these experiments at the same time, in case an egg is accidentally dropped), I think it would be difficult to conclude very much from the experiment, other than the fact that toothpaste may help to protect an eggshell from vinegar.

One-half of the egg is immersed in toothpaste for four full days. It is stated that this part of the shell is less soluble in vinegar at the end of this time. This may be the case, but I know of few people who keep toothpaste in contact with their teeth for four full minutes, let alone four full days. I suppose it could be argued that repeated contact of the toothpaste with teeth might have a similar affect, but this particular experiment does not prove this hypothesis.

This letter is not written to condemn the use of fluoride toothpaste. There is ample proof that toothpaste containing fluorides is beneficial. However, I do not think that the Canadian Dental Association should be encouraging patients to waste time and eggs on an experiment which seems to have more to do with eggshell solubility than dental caries.

I suppose the eggs could be used later in omelettes, but they might taste a bit vinegary.

Ralph I. Brooke, Dean
University of Western Ontario

A Call For Help From The Dominican Republic

The Grey Sisters of the Immaculate Conception from Pembroke, Ontario, have lived and worked in the Dominican Republic since 1951, working in education and health. Our goal has always been to enable the people here to help their own people.

Several months ago, while having my teeth attended to by a local dentist, who is a native Dominican, he offered to do dental treatment for poor people without charging for his labor. However, he cannot afford to supply the materials. The dentist tells me that the supplies he requires most are anesthetics and needles, cotton products, filling materials, dental burs, suturing materials, antibiotics, fluorides, and tooth brushes.

I invite Canadian dental organizations and individual dentists to donate these urgently needed dental consumables to a very worthy cause. They would go a long way in alleviating the suffering of a wonderful group of people.

Sister Joan Nugent
Convento Chisto Rey
Yamasa, Dominican Republic.

Dental Fees

Editor's Note: Last month the *Journal* published a letter from a dentist concerned about the cost of implants (*Cost of Implants*, 60(4):264, 1994), and a responding letter from the president of the Canadian Academy of Restorative Dentistry and Prosthodontics. The following response is from the president of the Canadian Association of Oral and Maxillofacial Surgeons.

Dr. William McJannet has stated that implant surgery is simple and therefore the profession should reduce their fees. The average lay person feels similarly about most dental procedures. A process must, therefore, be in place to establish reasonable professional fees for all dental procedures.

It is our professional responsibility to provide the best care possible to our patients. It is the provincial dental associations' responsibility to set fee guides that are reasonable and

fair to both the patient and the practitioner. A standardized relevant value unit (RVU) evaluation format is used to establish fees for any procedure. Considering the multiple variables involved with implant surgery — costs of materials, necessary specialized equipment, training, number of surgical appointments and length of time between initial surgery and soft tissue uncovering — a value for the service is given which reflects the time, expense and responsibility required to provide excellence in care. The success of any implant case is procedure sensitive and the fee reflects the cost of the time and expertise needed to enhance success.

It is true that as the manufacturer recovers research and development costs, the price of materials should lower, especially in a competitive market. As practitioners gain more experience with the procedures, it is possible that professional fees will also have a downward trend.

As with most dental treatment plans, there are alternative plans which can be suggested that are less expensive and yet are biologically acceptable. Although in an ideal world it would be nice to provide the best and most expensive treatment plans to all patients, this is an unrealistic expectation. Even third party insurance carriers would not agree.

In order that dentistry move forward with improvements in clinical care, continued research is needed, supported by the funds generated by our benefactors. The present cost of implant dentistry is a reflection of this process in action. Any attempt to move away from this process will only serve to reduce further research and thwart improvements in restorative procedures for our patients.

Philip L. Cyr, DDS, M.Sc., FRCD(C)
Halifax, N.S.

Note: The editor maintains the right to edit letters for space and clarity. Letters submitted for publication in the *Journal* must include the full name and address of the author, and must be signed. Photocopies will not be accepted.

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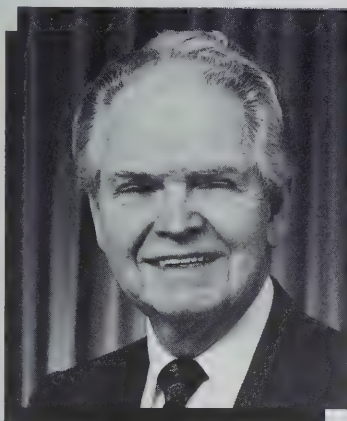
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EDITORIAL

THE GUIDING LIGHTS



Dr. P. Ralph Crawford,
Editor

Last winter, I became embroiled in a battle with the elements which, in a strange way, reminded me of the inner workings of the dental associations to which we all belong.

It was December 22, and my wife and I had bundled into the car in Ottawa to embark on a 1,400 kilometre trip to spend a family Christmas in Charlottetown, P.E.I. Most of our Eastern friends had expressed amazement that we would actually venture out on such a trek in the dead of winter. But then they hadn't reckoned on the determination of two hardy, Prairie-born types. Nor were they aware that I had driven the 75-kilometre stretch between Moose Jaw and Regina five-days-a-week for three straight years during the 1950s — in every possible type of weather — while earning enough pre-dent credits to get into dental college.

This latest trip wouldn't throw anything at us that we hadn't seen before — or so we believed. We left Ottawa just after lunch, in the snow. We knew we were in trouble a few hours later, close to Montreal, when the road became harder and harder to see through the blowing snow. Not to worry — it was still daylight. We slowed down a bit and kept on, but the winter darkness arrived quickly. Within minutes, we couldn't see more than a few feet in front of

us. We knew the perils of trying to pick out the road in the dark in a blizzard, but we didn't want to stop because of the risk that someone would slam into us.

More by good luck than bad planning, a large tanker trailer, whose driver — high up in the tractor cab — had a better view of the road than we did, passed us. Peering through the dark into the swirling snow, I saw three red lights shining from the back of tanker in the shape of a triangle. It was a perfect beacon for me to "home onto" and follow. As long as the tanker, steered by its professional driver, stayed on course, so would I.

What was to have been about a six-hour drive between Montreal and our scheduled over-night stop at Rivière-du-Loup turned into a long nine-hour marathon. But throughout the ordeal, I was comforted by those three guiding lights. Keeping them within sight, I had few doubts of our ultimate safety.

Dentistry is like that. We depend on certain guiding lights to keep us on course. Some of the most important of these guiding lights are our professional associations. In Canada, the dental pioneers can be likened to the tanker driver who led me to safety on a snowy road. These pioneers seemed to have stood taller than the rest of the crowd, and they had a vision of the journey ahead. Some of the names that come to mind are: Dr. Barnabus Day of Ontario; Dr. Eudore Dubeau in Quebec; Dr. Frank Woodbury in the Atlantic Provinces; Drs. Benson, Cowan and McLure on the Prairies; and Dr. Thomas Jones in British Columbia. They were the visionaries who kindled the lights that established our great associations. We owe them a great debt.

Possibly nothing in recent months displayed more clearly just how important these guiding lights are than the events leading up to the recent federal budget. Rallying together in a unified front, the national association, the 10 provincial associations, and dental patients across Canada were able to convince the law makers that taxing dental benefits and lowering RRSP limits were unacceptable solutions to the nation's deficit problem. In this instance, and countless thousands of others, where

would we have been without our dental associations and their leaders?

Each of Canada's 10 provincial dental associations has been around a century or more — the Northwest Territories Dental Association, founded in 1889, was the forerunner of both the Alberta and Saskatchewan associations, which were formed when those provinces were enacted in 1905. And in eight more years, CDA will also celebrate its centenary.

Down through the decades, each of these associations has endeavored to provide the best of dental care to Canadians and enlighten the future of their members. I deplore crass criticism of our dental associations — particularly when it comes from dentists who have never made any effort to assist in governing their profession. On the other hand, we all appreciate the constructive commentary of those who strive to make our guiding lights shine brighter. Only the concerted efforts of hard-working supporters will allow our various dental bodies to continue their role as forceful entities influencing dentistry's future.

Even the triangle of lights on the back of the tractor trailer that led my wife and me to safety has a certain dental significance. True association membership is like three points of a triangle, guiding us on a straight course. One point begins at home, within the local dental society. The second point is the provincial organization, while the apex is the national association. Only by maintaining membership and support in all three organizations will dentists throughout the land be guided in a united front. ■

*P. Ralph Crawford, BA, DMD
Editor of the Journal of the
Canadian Dental Association*

Errata:

Due to an editing error, the dental chair depicted in Fig. 1 of Dr. Marilyn Miller's article, "Infection Control Considerations When Designing and Equipping a Dental Office" (60(3):, 196-201, 1994), published in the March issue of the *Journal*, was identified as an A-Dec product. In fact the chair shown in Fig. 1 was manufactured by Proma Inc. The *Journal* regrets the error, and apologizes for any confusion that it may have caused.

JOURNAL

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No. 5

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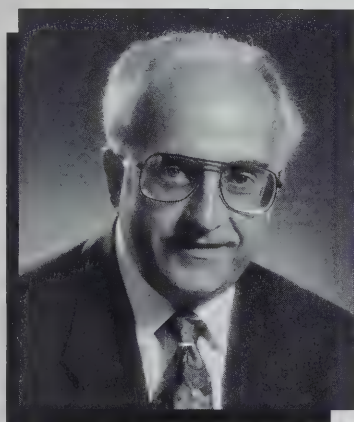
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PRESIDENT'S COLUMN

TOWARD A NEW BEGINNING



*Dr. Raymond Wenn,
President of CDA*

Most of us know how good it can feel to resolve a long-standing disagreement, particularly when the dispute involves a family member. If you're like me, you breathe a big sigh of relief that the bitterness and recrimination are behind you, and that the healing process can begin. And you usually ask yourself why it took so long to find a solution.

As many of you realize, CDA and the Quebec Dental Surgeons Association (QDSA) have had a long-standing disagreement concerning the use of the surplus funds in the Canadian Dentists Insurance Program (CDIP) life and disability plans. The dispute originated in 1984, when QDSA took the position that CDIP surplus funds should be distributed on a regular basis to the plan participants who had contributed to them, and that this was the only appropriate use of these funds. QDSA also held that if a corporate member ceased to participate in CDIP, surplus funds should be distributed to that member on a proportional basis.

CDA and the other nine members of our corporate family disagreed, as we believed that this was not the intent of CDIP's founders when the

plans were established, or at any time thereafter. In CDA's view, surplus funds should be used to benefit the insurance plans themselves, thereby providing a general benefit to all CDIP participants.

In 1991, QDSA broke away from CDIP and launched its own insurance plans. Shortly thereafter, QDSA initiated legal action to recover a portion of the CDIP surplus funds on behalf of Quebec Dentists. However, this action was put in abeyance when CDA agreed to seek a judicial determination of the broader issues relating to the use of CDIP surplus funds, and requested a hearing before the Ontario Court of Justice (Commercial Court). The hearing took place in early 1992.

That is where things stood on December 24, 1992 — a Christmas Eve I will never forget — when members of CDA's management committee learned that Justice William McKeown had rendered his decision the day before. In effect, the justice found that CDA's executive council, as trustee to the surplus funds, had allowed them to be used in a manner that was inconsistent with its trust responsibilities. His ruling stated that CDIP surplus funds generated between 1977 and 1985 must be distributed, on a pro-rata basis, to the thousands of individuals participating in the plans at that time.

CDA, acting on the advice of its lawyers, subsequently appealed Justice McKeown's ruling. This process concluded March 22, when Justices Blair, Osborne and Austin of the Court of Appeal For Ontario set aside the disbursement order made by Justice McKeown, and found that, in most instances, CDA's executive council had used CDIP surplus funds in an appropriate manner.

In effect, the Court of Appeal determined that the participation agreement, signed by CDA and its corporate members when the insurance plans were established and annually thereafter, required the use of surplus funds to be confined to the plan in which they were generated. Further, the court ruled that these surplus funds could be used to benefit participants in this plan generally, and that it was not necessary to restrict the benefit to the participants

whose premiums had actually generated the surplus funds.

Based on this principle, the Court of Appeal determined that executive council acted appropriately when it approved the use of CDIP surplus funds for a graduate subsidy, a male/female premium rate differential, a non-smoker premium discount, premium discounts, and a life plan contingency reserve fund. However, the Court disagreed with executive council's decision to loan money from the life plan surplus funds to the disability plan — because this "took surplus beyond the plan which produced it." The Court of Appeal therefore ruled that CDA must repay this loan immediately, with interest. (In fact, the loan had already been repaid in full, albeit without interest.)

As is the case in most family disagreements, neither side in this dispute was entirely right. While the Court found in favor of CDA in most instances, it chastised executive council, as the trustee of substantial surpluses, for not having sought advice long before it did, particularly when there was a clear disagreement over how surplus funds should be used. The court also agreed with QDSA that the distribution of surpluses should occur in a more timely fashion.

It is indeed unfortunate that the disagreement over CDIP surplus funds created a rift in the CDA family that resulted in court action. It is equally unfortunate that this dispute has consumed so much energy on both sides of the issue, to say nothing of financial resources. I sincerely hope that with the Court of Appeal's decision, CDA and QDSA will be able to resolve their differences amicably, and move on. After 10 years, I am sure that everyone involved with this issue is looking forward to the day when they can take that big sigh of relief, and leave all the bitterness and recrimination behind them.

Raymond Wenn, DDS
President of the Canadian Dental Association

JOURNAL

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1994
Vol. 60
No. 5

MAY, 1935

OUR PRESIDENT ADDRESSES THE DENTAL BOARDS OF CANADA RE AN EMERGENCY

April 10th, 1935

The Secretary,

College of Dental Surgeons,

Dear Doctor:

After consultation with the members of the executive of the Canadian Dental Association, I am officially bringing to the notice of your body the situation in which British Columbia's College of Dental Surgeons finds itself. It is unnecessary to go into details, but the outstanding points are as follows:

They are facing an appeal to the Supreme Court of Canada, which is expected to cost them approximately \$1,700. Having spent \$2,500 already in connection with the same case, their treasury is practically depleted. If this case is not appealed and won, it leaves dental laboratories in a position to practise prosthetic dentistry unhampered by dental laws. You can readily see that a condition such as this being allowed to exist in British Columbia would very soon be

quoted as a precedent and would affect any one of our provinces.

The Canadian Dental Association is rendering all the moral assistance which it can, but owing to our very limited financial position, we are unable to assist in that direction. However, we are formally bringing this matter to the various provincial boards for their serious consideration, and asking them to render what financial assistance they can, as well as their moral support to British Columbia in her hour of trial. We hope that our Canadian Dental Association may, in the near future, receive more adequate financial support and thus be able to step into the breach as a national body in such a situation as this.

Would you be good enough to bring this to the attention of your association as soon as possible and if you can see your way clear to render assistance, kindly communicate directly with Dr. W.J. Lea, Secretary, British Columbia College of Dental Surgeons, 1520 Medical-Dental Building, Vancouver, B.C.

Yours sincerely,
G.L. Cameron,
President, CDA

LET US THINK NATIONALLY

By John S. Lapp, DDS, Toronto, Ontario

60

We, the dentists of Canada, occupy a strategic position in the battlefield of the constant war against the greatest of all invading armies, that vast and formidable bacterial horde which manifests itself in the form of sickness and disease.

This great silent army advances both by day and night and knows no provincial boundary lines.

The dental profession has, in recent years, attained a position in the front lines, shoulder to shoulder with our medical confreres against

this common enemy, and is today accepted as an integral part of all important major health programs.

When one considers, for a time, the importance of our position in the health program of this great Dominion, it becomes more and more apparent that we should be thinking and acting in a more national sense than we have been accustomed to in the past.

The spirit of provincialism that seems to have our profession so tightly in its grasp, is undoubtedly a natural outcome of the present plan of provincial licensing under which, we must, of necessity, set up distinct provincial boundary lines.

It is true that we have had a Canadian Dental Association functioning for years, but even under the leadership of some of the best men in the Dominion, this association has not been able to break down the barriers of provincialism to a satisfactory degree.

We have been passing through trying times during the past five years and many of us have learned that combined action on a combined front is necessary to accomplish results in any dental activity. This combined action becomes more effective as it becomes more national in scope. It is the opinion of some of the political leaders of Canada that certain health measures should be placed on a more national basis; in fact, we understand that in the near future, a conference of provincial ministers of health, meeting with the minister of national health in Ottawa, will discuss the whole problem of national health.

The matter of health insurance in Canada is a very live issue at the moment. The lack of opposition to the unemployment insurance legislation at the present session in Ottawa is some indication of the present trend towards social legislation in Canada, and by all indications we may expect social health legislation in the very near future.

The Canadian Dental Association has given this matter considerable study, and has at present a state dentistry committee, which is quite active and is keeping in very close contact with the situation. The personnel of this committee is as follows:

Chairman — Dr. J. S. Lapp

Secretary — Dr. F.J. Conboy

Treasurer — Dr. E.C. Veitch

Executive — J.C. Devitt, Arthur W. Ellis, Andrew J. McDonagh, W. Cecil Trotter, E.C. Veitch

Provincial Representatives — Dr. E. Fraser Allen, Dr. F. Boyaner, Dr. R.R. Dalgleish, Dr. J.C.

Flanagan, Dr. Harold Johnson, Dr. V.H. Macaulay, Dr. A. McMurdo, Dr. H.J. Merkeley

The question of socialized dentistry in Canada should be a matter of study for every man practising in this Dominion.

Dentists either individually or in groups should discuss this question with their provincial representative and he in turn will pass on helpful suggestions to the secretary or chairman.

The executive of the committee on state dentistry has the situation well in hand at present, and would welcome suggestions through the provincial representatives.

Let us all work together and in matters of national importance put up a solid national front.

Diamond Jubilee of Publication

Throughout 1994, the Journal of the Canadian Dental Association celebrates 60 years of publication as the authoritative "voice" of dentistry in Canada. Each month, in commemoration of its Diamond Jubilee, the Journal will reprint an article from Vol. 1, 1935.

Clearly, the dental profession grappled with many of the same types of issues in 1935 as it does today. There is still a need for dentistry to speak with a united voice, as demonstrated by CDA's recent success in convincing the federal government to reconsider its plans to tax dental benefits and reduce RRSP contribution limits. Once again, the "matter of health insurance in Canada is a very live issue at the moment," and organized dentistry is "keeping in very close contact with the situation."



BOOK REVIEWS

Osseointegrated Dental Technology

By Graham E. White

1993, Quintessence Publishing Co., Inc., Chicago

233 pages, color illustrations, \$98 (U.S.)

This book is intended for dentists and dental technicians, both experienced and novice, who are interested in the fabrication of implant-supported prostheses. The author is well qualified as a technician and as a researcher, and he combines practical descriptions with research data in an effective manner. His treatise is thoughtfully divided into preliminary chapters on the background and surgical basis for osseointegrated implants, but it is primarily concerned with prosthetics — from provisional restorations, through fixed and removable framework and prosthesis fabrication. The sections on maintenance and repairs, and technical data, are particularly helpful for the day-to-day management of patients with implant-supported prostheses.

Depending on the reader's predilection, the fact that this text is devoted to the Branemark system of implants may be seen as either an advantage or a liability. Although the components described are limited to one manufacturer, the principles detailed are universally applicable to any implant prosthesis and the author does not appear to engage in unconditional support of Nobelpharma components. In the chapter on overdentures, for example, he provides some worthwhile information regarding potential problems with Nobelpharma's plastic bar patterns. However, the chapters describing the use of Nobelpharma's Angulated, Cera-One and Estheticone abutments may be of limited interest to practitioners utilizing another implant system.

The most helpful technical section of the book is undoubtedly the chapter on the design and casting of implant frameworks. Dr. White and his colleagues at the University of Sheffield in England have been innovators in this field of dental research, and the principles and techniques illustrated provide one of the most complete descriptions available re-

garding this critical but often poorly executed step.

In summary, this text provides a thorough, up-to-date review of the technical aspects of implant prosthetics in a well-organized and well-written format. It is highly recommended.

Reviewed by:

Joanne N. Walton, CD, DDS, Cert. Pros., FRCD(C)

Assistant professor, division of prosthodontics, faculty of dentistry, University of British Columbia.

Dental Management of the Medically Compromised Patient 4th edition

By James W. Little and Donald A. Falace

1993, C.V. Mosby Company, St. Louis
590 pages, 189 illustrations and 282 tables, \$54.

In their preface, the authors of this classic text state that an up-dated fourth edition was necessary because of the ever-increasing flow of new knowledge and the changing concepts in medicine and dentistry. This growth is reflected by the physical size of the book, which has more than doubled in length since its first edition was published in 1980.

The text provides the reader with an up-to-date, concise and factual reference describing the dental management of patients suffering from specific medical problems. The authors state that although the book is not a comprehensive medical reference, it contains enough core information about each of the selected medical conditions to enable the reader to recognize the basis for various dental management recommendations.

The most outstanding feature of the book is its organization. It begins with a 75-page table entitled "Dental Management: A Summary," in which a variety of medical conditions are listed and tabulated under the following headings: potential problems related to dental care; prevention of complications; treatment

plan modifications; oral complications; and emergency care. As a clinician, I find this to be a useful approach.

The book's first edition contained 22 chapters. The fourth edition consists of 27 chapters and two appendices — one on infection control and one on the therapeutic management of common oral lesions. New chapters have been added in topical areas such as organ transplantation and prosthetic implants. Particular attention is given to the prevention of infection as a result of dental treatment. The chapter on venereal diseases has been re-written and re-titled "Sexually Transmitted Diseases," and a thorough chapter on AIDS and related conditions has been added.

There are eight excellent chapters dedicated to cardiac conditions ranging from infective endocarditis to rheumatic heart disease, congenital heart disease, surgically-corrected cardiac and vascular disease, hypertension, ischaemic heart disease, cardiac arrhythmias and, finally, congestive heart failure. These chapters are up-to-date and contain the American Heart Association's current recommendations for the prevention of endocarditis.

The chapters on bleeding disorders and blood dyscrasias are clinically useful. And there is also a well-written chapter on pregnancy and breast feeding. Throughout the book, summary tables are used to provide easy access to the material discussed in each chapter. The figures are adequate and serve to appropriately illustrate the text.

This book is recommended as a useful source for practising dentists, dental hygienists, graduate dental students in all specialities of dentistry, and for dental students and students in dental hygiene.

Reviewed by:

George K.B. Sandor, MD, DDS, FRCD(C), FRCS(C)

Hospital for Sick Children, the Hugh MacMillan Rehabilitation Centre, the Etobicoke General Hospital and Humber Memorial Hospital, Toronto, Ontario.

Pathology of Periodontal Disease

By David M. Williams, Francis J. Hughes, Edward W. Odell, and Paula M. Farthing

1992, Oxford University Press, New York. 150 pages with b & w illustrations. \$52.95.

This text was written for undergraduate and postgraduate dental students, and for dentists preparing for Royal College Fellowship examinations. As indicated in the title, the book deals with periodontal disease pathogenesis, including microbiological and host factors.

The 150-page text is divided into eight well-organized chapters, which are subdivided into several sections that make each topic easily identifiable. Beginning with the classification, etiology and history of periodontal diseases, the authors take the reader through the normal periodontium, disease anatomy, microbiological and host factors of periodontal diseases, disease progression and clinical management of periodontal disease.

In each chapter, the text is illustrated with either figures, tables, diagrams, clinical photographs or photomicrographs — all are of excellent quality. I particularly liked the highlighting of the figures and tables, which enhanced the diagrammatic

representations of anatomic features as well as the information set out in table form. At the end of each chapter, the authors provide an excellent summary of the critical points.

The book's index is detailed, with subheadings, allowing easy reference to material presented in the text. A glossary is also included. The bibliography for each section includes standard textbooks and journal articles, which provide the reader with ample further reading to expand on the information provided in the text.

Although this text deals primarily with the factors contributing to periodontal disease pathogenesis, the early chapters describe the nature of periodontal disease (types, etiology, natural history) and the characteristics of the normal periodontium. Once this foundation has been laid, the book moves on to more specific details of disease pathogenesis.

The authors discuss the specific versus non-specific plaque hypothesis, and describe the microbial component of gingivitis and periodontitis, including bacterial types, plaque development and plaque pathogenicity. Characteristics and virulence mechanisms are given for several specific bacterial pathogens.

The effect of host factors and the immune or inflammatory response can be a difficult topic, but the authors make this material less complicated by describing the events in

a logical and well-written sequence. The many diagrams and tables summarizing the details of the text are invaluable aids to the understanding of this aspect of periodontitis.

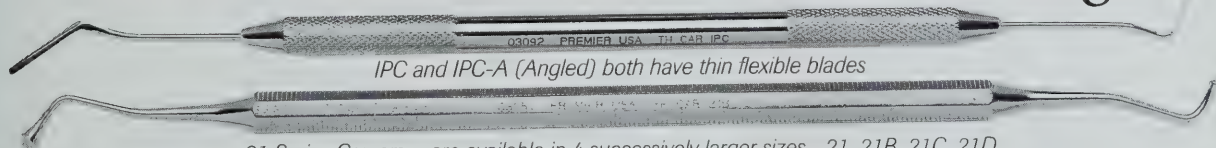
The influence of both bacterial and host factors on specific periodontal tissues (epithelium, connective tissue, periodontal ligament and alveolar bone) is discussed, along with the mechanisms of destruction and host responses that can lead to disease progression. As well as adult periodontitis, other types of periodontal disease are presented and discussed: early onset disease; ANUG/ANUP; and HIV-related periodontitis. Clinical characteristics, microbial etiology and host factors are included for each disease, and clinical photographs and tables enhance the description and diagnoses.

This is an excellent text. The material is readable, concise, and well-organized. It would be a wonderful reference text, not only for the student population but also for those who are teaching undergraduate or postgraduate periodontics.

Reviewed by:

Helen Scott, B.Sc., DDS, Dipl. Perio.,
M.Sc., RCDC(M)
Assistant professor, University of British
Columbia

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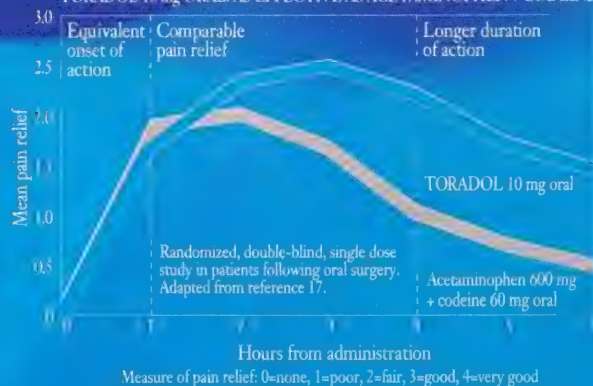
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NEWS UPDATE

Fluoride Advocate Dies At Age 68

Dr. Max Florence, president of the Ottawa Dental Society in the early 1960s and a mainstay in the protracted fight to fluoridate Ottawa's drinking water, died March 3, 1994, in Toronto. He was 68.

Ottawa's bitter fluoridation campaign ended in defeat in a 1962 plebiscite, but this vote was overturned two years later with a decisive victory. Fluoridation was initiated in Ottawa November 15, 1965. In 1969, the Academy of Medicine of Ottawa awarded Dr. Florence an honorary membership for "service to the community...through his devoted work on behalf of fluoridation."

Dr. Florence was born and raised in Peterborough, Ontario. He practised in Ottawa for 19 years after receiving his DDS from the University of Toronto in 1950, but moved to Jerusalem in 1969. Dr. Florence returned to Canada in 1978, where he practised until 1993. He was chief of dentistry at the Baycrest Centre for Geriatric Care for 10 years, and was recognized as the inventor of the Sulcabrush, an oral hygiene aid. ■

Toronto Dentist Appointed To ASGD Board

Dr. Aldo Boccia of Toronto was recently appointed to the board of the American Society of Geriatric Dentistry (ASGD).

Dr. Boccia, who succeeds Dr. Ralph Crawford of Ottawa as the Canadian representative to the 14-member ASGD board, attended his first ASGD board meeting during the Conference on Special Care Issues in Dentistry in Chicago this April. Dr. Crawford had held the board position for seven years.

A graduate of the University of Toronto, Dr. Boccia received his B.Sc. in 1970 and his DDS in 1974. He now maintains a general private practice with an emphasis on geriatric

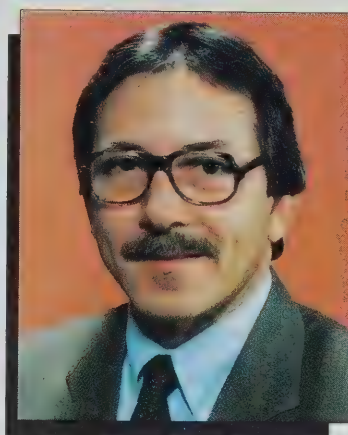
dentistry, and is head of dental services at St. Joseph's Health Centre in Toronto, and the Toronto liaison officer to the board of the American Association of Hospital Dentists.

Dr. Boccia is a fellow of the Academy of General Dentistry. He has been active in dental committee work with the Ontario Dental Association, and is past-president of the West Toronto Dental Society and the Toronto Academy of Dentistry. ■

Student Clinicians Program To Celebrate 24th Anniversary At FDI

If Mr. George R. Rhodes, Dentsply International's vice-president for professional relations and corporate communications, is right, the 1994 CDA/Dentsply Student Clinician Program in Vancouver — which marks the 24th anniversary of the event in Canada — will be more popular and instructive than ever.

Mr. Rhodes, who is responsible for Dentsply's student clinician programs in Canada, the United States,



Mr. George R. Rhodes, Dentsply International's vice-president for professional relations and corporate communications.

Australia, Germany, the United Kingdom and the five Scandinavian nations, believes the venue for the 1994 Canadian program — the joint CDA/FDI international dental meeting in Vancouver next October — is a sure winner. In fact, the week-long event stands to be the single biggest dental meeting ever held in Canada. ⇨

Toronto Oral Surgeon Awarded Table Clinic Prize

Dr. Jack Zosky, a Toronto oral and maxillofacial surgeon, was awarded first prize for his table clinic presentation at the ninth annual Academy of Osseointegration meet-

ing in Orlando, Florida, in March. He subsequently donated the \$500 U.S. award to the academy's foundation, which fosters research, education and charitable efforts. ■



Dr. Zosky (l) donates his \$500 first-place cheque to the Academy of Osseointegration. Mr. David Swingley (r), executive director of academy, accepts the donation.

Under the terms of the CDA/Dentsply program, participating student clinicians are selected by their schools and compete at the annual meeting in accordance with eligibility requirements and other regulations established and administered by CDA. All Canadian dental faculties routinely participate in the program, and most student clinicians are selected on the basis of competitions held at their individual schools.

Throughout CDA's annual dental meeting, the students compete in two categories, Clinical Application and Techniques, and Basic Science and Research. Student clinicians are judged by a qualified panel selected by CDA, with emphasis on subject matter, methods of presentation, and the table display used to illustrate the clinic. First prize is a travel award for the student to attend the American Dental Association annual session, where he or she represents the winning clinic on a non-competitive basis, along with U.S. clinicians and winning students from other international Dentsply-sponsored programs. A \$500 cash

prize is awarded for second prize. Dentsply funds all program-related awards, manages administrative details related to travel, hotel accommodations and per diem expenses for each student clinician, and absorbs the associated costs. The company also sponsors a well-attended reception and dinner to honor all participants. ■

CDA Concerned By Health Canada Dental Claims Processing Document

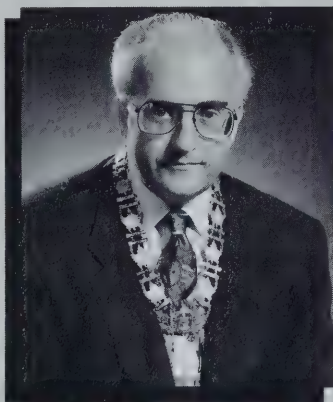
In a letter written to Health Canada March 11, 1994, CDA's executive director, Mr. Jardine Neilson, expressed concern regarding a proposed dental claims processing system. In his letter to Dr. Doug A. Shedden, Health Canada's assistant director of epidemiology and community health specialty, Mr. Neilson said:

"It has recently come to my attention that Medical Services Branch is planning to issue a new policy document, *Dental Claims Processing System — Release II*, in July 1994. This will include a practitioner's information kit for non-insured benefits that is being prepared for review by Blue Cross and the Regional Dental Officer.

"We understand that the intent of this program is to change the manner in which native Canadians access dental services in private practitioner's offices and reduce the amount of paper work burden for federal officials. While this is a commendable goal, CDA is concerned that the review process does not appear to include any provider input. The potential outcome may be that the burden is not eliminated, but will move to the dental office.

"I believe it is extremely important that CDA representation be included in the review process. I am sure you will agree with the fairness of an approach which includes input of all the jurisdictions effected by the new policy under consideration." ■

Board Approves New Infection Control Workbook



Dr. Ray Wenn, President of CDA

Following extensive consultation with the provincial licensing bodies and its corporate members, CDA's board of governors has given its stamp of approval to a national infection control workbook.

Developed by Dr. Trey Petty on behalf of CDA, the new workbook will provide dentists with an easy and effective way of recording the infection control procedures followed in their practices on a daily, weekly and monthly basis.

The *CDA Workbook On Infection Control: A Companion To the CDA Guidelines On Infection Control* will be published in a fill-in-the-blanks format and bound in a loose-leaf binder to allow easy updating. In the section on personal protection, for example, the workbook reviews CDA's recommendations on when gloves should be worn, and then provides space to record the brand names and sizes of the gloves used in the dentist's practice.

While it is intended to complement CDA's existing *Recommendations For Infection Control* (1989 & 1991), the workbook does not define a standard of practice and is not intended as a policy statement in its own right. It is published

solely as a resource for dentists and allied dental personnel.

The new workbook was given the green light by CDA's board of governors during its interim meeting April 9 in Ottawa, and should be available to CDA members this fall. At the same meeting, the board approved a recommendation that "CDA consider sponsoring a national/international conference on dentistry and infection control."

But infection control was not the only issue on the board's agenda. The governors also approved terms of reference for a new ad hoc committee on clinical guidelines/standards of care, and agreed that CDA should contribute \$10,000 to a national study on the supply and demand for dentists, dental hygienists and dental assistants in Canada.

The new ad hoc committee will "review, monitor, and advise" on developments with respect to clinical guidelines/standards of care in each of the 10 Canadian provinces, and "suggest common ap-

proaches, philosophy, structure and terminology" that may help the licensing authorities in each province to develop positions that are consistent and harmonious with the positions of their counterparts in other provinces. In addition, the committee will examine the feasibility and planning of a national conference on clinical guidelines/standards of care.

CDA's support for the Dental Care Occupations Labour Market Model is contingent on the project receiving \$45,000 in federal government funding, as well as support from the provincial licensing authorities, the Canadian Dental Hygienists' Association and the Canadian Dental Assistants' Association. If the project goes ahead, dentistry will match the government's \$45,000 contribution.

The board also approved a recommendation that CDA, on behalf of Canadian dental students, "strongly support the establishment and continuation of *all* hospital internships in Canada as an important service for the public and an excellent educational vehicle." This recommendation follows media reports that hospital internship programs may be cut back or eliminated as provincial governments, particularly in Ontario, wrestle with out-of-control budgets and increased health-care costs.

At the same time, the board moved to formalize CDA's position on the taxation of dental benefits by approving a new policy statement on publicly funded dental plans. The policy states that:

The Canadian Dental Association believes that a combination of public and private funding is re-

quired to meet the dental health care needs of the Canadian public. To this end, it supports the following principles:

1. The Canadian Dental Association strongly opposes the introduction of taxes on third party dental plan benefits as a counter productive measure which would adversely impact access to dental health care services for the majority of Canadians.

2. The Canadian Dental Association supports public funding exclusively for individuals or groups with specific needs as distinct from universal dental care programs. Publicly-funded programs should be directed to the needs of those requiring special consideration or support to facilitate their access to dental health care.

The board also moved to simplify the eligibility requirements for the CDA RSP and RIF programs. In effect, any individual participating in the CDA RSP or RIF programs prior to January 1, 1995, will remain eligible for further participation in those programs, and will not be required to meet any new or additional eligibility requirements. However, individuals seeking to participate in either the RSP or RIF program after January 1, 1995, must be a member of CDA or an eligible dental organization, or the employee or spouse of such a member — and pay a \$50 annual processing fee to CDA. **This fee will be waived for CDA members, as well as their employees and spouses.** Employees of CDA or eligible dental organizations will also be allowed to participate in the CDA RSP and RIF programs, and

will also be exempt from the processing fee.

The new policy replaces the CDA RSP and RIF eligibility requirements approved by the board last fall, which required RIF participants to have been a member of CDA for the past five years.

Also of note was the board's approval of a recommendation to keep 1995 active and affiliate membership fees at their 1994 level of \$425, but to raise the corporate fee to \$25, an increase of \$10. The board also agreed that CDA would not ask provincial licensing bodies to increase their annual grant to CDA, which will remain at \$22 per licensed dentist in 1995.

The corporate fee increase reflects CDA's actual structure. CDA is comprised of provincial corporate bodies, which pay an annual per-member fee to the national association. This fee is intended to compensate CDA for the national activities that the association undertakes on behalf of the dental profession as a whole, such as the free distribution of the *Journal of the Canadian Dental Association* to every dentist in Canada.

The 1995 corporate fee increase reflects CDA's desire to develop a fee structure that more closely represents its corporate nature. To this end, CDA's committee on structure and relationships is examining the association's current fee structure, as well as its existing organizational structure, to determine if they can be made fairer or improved. Recommendations from the committee, if they are forthcoming, will be brought to the board for debate and approval prior to implementation. ■

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Tax Battle Not Over Yet



Dr. Robert Hicks

Although both Canadian dentists and their patients won an major victory February 22, when Finance Minister Paul Martin announced that the federal government would not tax dental and health premium benefits, the tax battle may be far from over.

Dr. Robert Hicks, the chairman of CDA's taxation committee, believes that Mr. Martin's decision to reconsider a planned tax on dental and health benefits was a very close call, and may be short lived.

In his report to the interim meeting of CDA's board of governors April 9, Dr. Hicks said that the government is likely to re-introduce the question of taxing dental and health premium benefits in the next federal budget.

Dr. Hicks, who met with senior officials from the finance department last month, said that while the government is now more concerned about the impact of a dental benefits tax on the oral health of Canadians, it still wants to tax employer-sponsored premium benefits.

The key for Canadian dentistry in the long run, said Dr. Hicks, will be for dentists and dental patients to continue to speak out against the tax.

"These are the only benefits in the country that aren't taxed... (other than employer contributions to registered pension plans). It's very important that we maintain a dialogue with our patients, and make them aware that this issue will be facing them again in the near future," he said.

In fact, Dr. Hicks believes that, ultimately, the voice of dental patients expressing their opposition will be the most effective influence in persuading the federal government not to tax dental care. To this end, CDA's communications staff is exploring various options that will help members inform patients about tax concerns,

and encourage them to continue speaking out against any tax on dental benefits.

Unfortunately, Dr. Hicks says that dental patients may face a double whammy over the next two years. He believes that the government is likely to maintain the GST, under a new name, and may broaden the base of the tax to include previously exempt or zero-rated goods and services — possibly including health care services such as dentistry. To lessen the impact, however, the GST will probably be reduced slightly from its current level of seven per cent. If this happens, Canada will be one of the few countries in the world to tax health care.

On a more positive note, Dr. Hicks believes that the finance department now accepts dentistry's argument that equity with registered pension plans must be the determining factor with respect to RRSP contribution limits for the self employed. Finance department officials indicated that the RRSP contribution limits are likely to level out at current levels for self-employed Canadians, and not drop to the \$8,500 level that had been proposed prior to Mr. Martin's February 22 budget speech.

However, like the dental benefits tax issue, the question of RRSP contribution limits for self-employed Canadians is likely to be back on the table in the next federal budget. The federal government is reviewing all pension plans, including RRSPs, during the fall of 1994. CDA, through its taxation committee, will be making a presentation to emphasize that self-employed individuals and those employed without sufficient pension plans should have equal access to tax-supported pension savings.

CDA's taxation committee will continue to monitor all issues, and will present dentistry's position at future hearings. CDA will also continue to lobby against these and any other measures that could have a negative impact on the dental profession and the oral health of Canadians. ■

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TABLE 1

Body weight	Dosage in capsules of Rovamycine '250' (750,000 I.U. Spiramycin/capsule)
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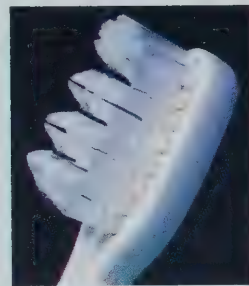
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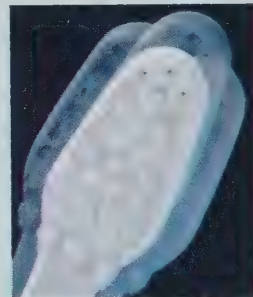
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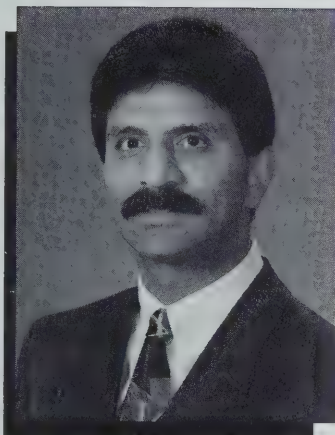
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Calling All Seniors: How to Meet the Needs of Geriatric Patients

Imtiaz Manji, B.Sc.

President of ExperDent

By reading through this month's *Journal*, devoted to the subject of geriatric dentistry, you've no doubt enhanced your understanding of the unique concerns and needs that must be addressed in successfully treating older patients. It's a huge issue and, given the aging population, it will demand ever-more attention from health care professionals, dentists being no exception.

But geriatric dentistry doesn't only pose unique questions and conundrums vis-a-vis treatment; there's a potential for a Pandora's box to take hold if practice management issues are ignored. Both the clinical and management arenas must grapple with geriatric needs if the profession is to meet the unprecedented challenges of caring for the aging.

Number-Crunching

Before launching into a general discussion of how to meet the needs and wants of geriatric patients, let's consider the following statistics, projections and facts:

- the "old" are the fastest growing consumer segment
- "old age" is now thought to begin at age 80
- those 50 and over, who now make up 25 per cent of the population, will comprise 33 per

cent of the population in the year 2026

- by the year 2000, the numbers of institutionalized persons, who now number approximately 143,000, will double to 300,000
- those aged 55 to 64 years, and those over 65, went to the dentist more in 1992 than in 1990
- dentists don't communicate as well with people over 65 (and generally, have a poor track record for serving this population)
- seniors are more likely than others to report that they receive "very little" or "no" dental health information from a dentist or hygienist
- 94 per cent of people use personal referral in selecting a dentist.

If you read between the lines of the above figures, it may have set off your internal alarm bell. Depending on whether or not you're integrating geriatric patients into your practice, you likely responded with a sigh of relief (you're on the right track) or a flush of panic (you haven't really distinguished the needs of geriatric patients from any others). The first group is identifying a tremendous practice-building opportunity, while the latter one may be wondering how to become more demographically correct.

Addressing Ageism

Regardless of whether you're presently serving geriatric patients or not, you can expect to be seeing more of them in the immediate and long-term future. Before you begin to consider the specific ways of dealing with the special needs of geriatric patients, you should ensure that your practice is an ageism-free zone. According to the Concise Oxford Dictionary, ageism is "prejudice or discrimination on the grounds of age." Whether it's systemic or subtle, ageism rears its ugly head in a number of ways. In a health care setting, it's often manifested by treating the elderly as children, even when they have their full faculties. This tendency to infantilize seniors imposes obstacles that would otherwise not enter the equation. Most significantly, it disempowers and frustrates the patients, the by-product of which can only form the nemesis of the patient-practice relationship.

Like any form of discrimination, the only way to confront ageism is to deal with it head on. Dentists must reflect on their own behavior — and that of their teams — to ensure that ageism isn't creeping its way, either consciously or unconsciously, into their practices. (I might add here that this is a particularly important exercise for young

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Serving Seniors: A Case in Point

Serving the special needs of geriatric patients may be uncharted territory for some practitioners, but for Dr. Aldo Boccia, the Canadian representative to the American Society for Geriatric Dentistry and the chief of dentistry at Toronto's St. Joseph's Health Centre, it's certainly not new. Dr. Boccia has had seniors on his mind for over a decade.

As part of the Ontario Dental Association's health care committee in the early eighties, Dr. Boccia was one of those responsible for spearheading the concept of mobile dentistry for the province's collective living centres.

"We realized that there were large numbers of people in nursing homes, group homes etc. that were not getting proper dental care," says Dr. Boccia.

And because of the expense and inconvenience of transporting these people, the mobile dentistry idea was born. For nearly four years thereafter, Dr. Boccia spent 1 1/2 days each week providing dental care to geriatric patients (and others in collective living environments) in the facilities where they lived.

"This is really the way to treat these people," says Dr. Boccia, who believes that without mobile dentistry, primary dental care needs are often neglected. "I've seen a tremendous number of cases where institutionalized seniors require treatment yet they still never get to a dentist."

Although Dr. Boccia is no longer one of the dentists participating in the mobile dentistry program, he still sees many geriatric patients as they comprise approximately 35 per cent of his patient base.

"They have special needs," says Dr. Boccia, "which we in dentistry need to recognize and

meet." In his Toronto office, Dr. Boccia certainly practises what he preaches, from scheduling short appointments in an operatory specifically designed for geriatric patients, to providing a "library" type reception area that houses a couch, television, and reading area. This relaxed setting was designed not only for the seniors he serves, but to provide a comfortable environment for those (care givers/family members) who often escort them to their appointments.

Dr. Boccia says that caring for seniors isn't just about prosthodontics. "I think the primary issue should be on prevention, just like with kids. As more and more seniors are keeping their teeth, we're learning that they are as prone to decay as teenagers."

He also has first-hand experience with so-called "youthful" seniors, who are increasingly interested in cosmetic dentistry. "Veneering is becoming popular," says Dr. Boccia, who recently applied acrylic veneers to an 82-year-old female patient. But if Dr. Boccia's practice is any indication, it's not just women who are interested in combating the natural yellowing/darkening of aging teeth — he has a 77-year-old male patient presently considering bicuspid to bicuspid veneers on his upper teeth. "This was unheard of 15 years ago," adds Dr. Boccia.

When asked how the dental profession is doing with respect to meeting the needs of geriatric patients, Dr. Boccia says that dentists are becoming increasingly attuned to this segment of the population, but that, "we have a long way to go. Seniors have 'paid their dues' in this country and supported it. We need to reverse the tendency to forget about people once they hit the age of 65." ■

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practitioners — those of Generation X or the tail-end baby boomers — who may be several decades younger than the patients they are treating.)

Special Needs Of Today's and Tomorrow's Geriatric Patients

Other than the fact that there are more and more seniors, you may be wondering what distinguishes this group from the seniors of yesterday. Well, the distinctions are many, not the least of which is the fact that many of today's elderly are keeping their natural teeth for their entire lives. And compared to its predecessors, this population segment has more disposable income; higher educational levels; and a stronger desire to remain youthful and independent.

The special needs of geriatric patients need to be considered with respect to the following:

Ergonomics

As dental practitioners, you're already aware of ergonomics, the science of arranging and designing the things people use in a manner that will maximize the effective interaction between the things and the people. (For more information, see "Designing Better Dentistry: The Ergonomic Approach" in the March 1992 issue of the *Journal* (58:172-173, 1992).) You've most likely considered the ergonomics of your practice from your and your team's perspective, be it the appropriate placement of equipment in the operatory to the optimal height of the dental chair. But when you broaden the ergonomic factors to include your patients, particularly the geriatric ones, you may discover that making it easy for them doesn't necessitate huge output — in terms of dollars or time — on your part.

Start by putting on a senior's "hat," and then intellectually dissect your practice, considering what a patient would encounter at a patient visit, from his or her arrival to departure. Ask yourself whether your practice is wheelchair accessible; aptly lit; easy to negotiate around (no unnecessary obstacles); acoustically sound;

soothingly decorated; and optimally heated/air conditioned. Although the esthetics of those chairs in your reception area might cause interior designers' "heads to turn," if they are tough to get in and out of, this furniture may be the bane of geriatric patients visiting your practice.

(However, I might add here that in thinking about practice ergonomics, you don't want to satisfy one segment of patients at the expense of another. You've got to strike a balance, one which will hopefully meet the needs and wants of the majority of your patients.)

Communications

If you are accustomed to treating every patient in your appointment book similarly, you're bound to get caught in a communication snag with geriatric patients. Dental teams need to be increasingly aware that each patient is an individual with a particular set of needs and wants that must be addressed.

Effective communication with geriatric patients requires sensitivity and common sense. Because of the sensory loss that often accompanies aging — be it impaired hearing, sight or speech — the dental team must accommodate patients by communicating with them in private, low-noise areas of the practice and at eye level (preferably with both parties seated). Allowing extra time for this communication is advised. (One of the most common blunders, when it comes to speaking to the elderly, is the tendency for people to yell at them. Speaking loudly and clearly to be understood is appropriate; yelling is not.)

For those geriatric patients who are unable to communicate effectively — either in relaying or receiving information — it is best to have a family member, friend or caretaker accompany them to their appointments. This will aid in eliminating any misunderstandings in treatment planning/acceptance and the issue of financial matters. As with all patients, supplying printed information to supplement verbal communication is important. For geriatric patients, though,

use large print in a legible typeface/font.

Access

Access to dental care is often thought of in terms of the location of a practice. Is it easy to get to? Conveniently located? Reached by public transportation? Although these are important factors, access can be considered more broadly when it comes to geriatric patients.

Some seniors are homebound or institutionalized, and it just isn't practical for them to get to the dentist. (As noted above, these numbers are destined to increase dramatically.) In such cases, dentistry must come to the patient or treatment will likely be forsaken. This is where the concept of mobile dentistry emerges. For some dentists, this "virtual practice" is an excellent way to add value to their actual practice. Other than acquiring portable equipment, overheads do not increase, but the likeliness of referral certainly does — the loved ones of these seniors will be duly impressed and may just end up becoming your new patient.

Appointment Scheduling

Because of the physical limitations of some geriatric patients, ensure that the timing and duration of their appointments are well thought out. There is no sense booking a 90-minute appointment for someone who becomes stressed after one hour in the dental chair. It will only make things uncomfortable for the patient, as well as difficult for the dentist to provide treatment.

Though the duration of appointments is important, the timing of them — often given less attention — is also vital. Depending on the physical condition of the patient, there are certain times of the day that are optimum for scheduling appointments. According to the *American Journal of Cardiology* (and reported in *Dental Update*, June 1992), cardiac patients are at a higher risk of sudden death in the early morning. As such, afternoon appointments are the most appropriate with this group. Knowing the physical conditions of your patients, through well-documented





and frequently updated medical histories, is your best strategy for determining the ideal time of the day to book their appointments.

Colleague Communication and Consultation

As underscored above, knowing your patient's medical conditions, and any physical or mental limitations they may bring to their dental appointments, is mandatory. With geriatric patients, this information-gathering process is likely to be more detailed and complex. It requires an appreciation and understanding of the patient's overall health, not just their oral health. Seniors are more likely than younger patients to be taking numerous medications and to be under the supervision of a variety of health care professionals, from medical physicians and physiotherapists to audiologists. Each of these professionals brings a unique perspective and insight to the overall care of the patients. And dentists owe it to themselves, their profession and, most importantly, their patients, to ensure that a holistic approach is taken.

The Patients Of the Future

With the aging population, geriatric patients are bound to form an ever-larger segment of the patient base of general dental practices. As such, it is incumbent on the profession to identify the particular needs of this group and to meet them. By doing so, dentists will cultivate loyal patients who, as "older consumers are motivated by quality, value, and convenience more than price." (*Texas Dental Journal*, March 1990) And by meeting their special needs, be it periodontally, cosmetically or prosthodontically, the tangible benefits — enhanced overall well-being and quality of life — are more magnified than for any other segment of patients. So not only is the treatment of geriatric patients a natural practice-builder, it stands to be potentially satisfying as well. ■

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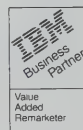
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Fund	Unit values at		12 Month Return %
	March 31, 1994	February 28, 1994	
Bond & Mortgage Fund	11.30816	11.56961	8.7%
Common Stock Fund	24.69580	23.59804	25.3%
Money Market Fund	66.39908	66.32321	4.2%
Balanced Fund	43.78736	43.38064	14.5%

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2 yr	5.60%	4.30%
3 yr	6.10%	5.10%
4 yr	6.50%	5.35%
5 yr	6.85%	5.90%

(*Rates subject to change without notice.)

Total Assets (market value) of the Plan as of

March 31, 1994	February 28, 1994
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Osteoporosis

In keeping with this month's CDA Journal theme, the library package topic is Osteoporosis, and how it effects the dental patient. Some of the selected articles provide the reader with a general overview of the disease, while others address specific implications of osteoporosis and considerations for patient care planning.

Among the articles contained in the May library package are:

- Roberts, W.E. and others. What are the risk factors of osteoporosis? Assessing bone health. *JADA* 122(2):59-61, 1991.

- Fisher, J.G. Osteoporosis in dentistry. [Review] *Gen Dent* 38(6):434-9, 1990.
- Liscum, B. Osteoporosis: the silent disease. *Orthop Nursing* 11(4):21-5, 1992.
- Kanis, J.A. Treatment of symptomatic osteoporosis with fluoride. [Review]. *Am J Med* 95(5A):53S-61S, 1993.
- Scott, J.C. and Hochberg, M.C. Prevention of osteoporosis. [Review] *Bullet on Rheumat Dis* 42(5):4-6, 1993.
- Shapiro, S. A discussion of alveolar bone physiology relative to implants for the elderly. *J Okla-hom Dent Assoc* 83(2):34-7, 1992.

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New Acquisitions

1. Graber, Thomas M. and Vanarsdall, Robert L. *Orthodontics: Current principles and techniques*. Mosby, 2nd ed., 1994.
2. Glenwright, H.D. and Strahan, J.D. *Periodontology: Self-assessment picture tests in dentistry*. Wolfe, 1994.
3. Grant, A.A., Heath, J.R. and McCord, J.F. *Complete prosthodontics: problems, diagnosis and management*. Wolfe, 1994.
4. Kaban, L.B. *Oral and maxillofacial surgery in children and adolescents*. Oral & Maxillofacial Clinics of North America. 6(1):Feb., 1994.
5. Shaw, L. *Pediatric dentistry. Self-Assessment picture tests in dentistry*. Wolfe, 1994.
6. Silverman, S. *Oral Cancer*. 3rd ed., American Cancer Society, 1990.

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CDSPI

High Stress-Related Claims Hurt Everyone

As a dentist, stress can take a great toll on your personal health and well-being. But the problem of stress in dentistry can also affect your pocketbook — through higher insurance premiums.

Stress is a major problem for dentists and the profession in general. In 1986, a survey in Finland sampled 232 dentists to examine their stress levels and the nature of their stress. It turned out that 41 per cent of women and 59 per cent of men experienced occupational stress that interfered with their performance. The most severe cases — the ones involving some degree of burnout — were marked by psychological fatigue, loss of enjoyment of work, and hardening toward patients.

In another study, the American Dental Association's Bureau of Economic Research and Statistics found that suicide rates among dentists were almost double those of other professionals.

But all the proof CDSPI needs of this issue's urgency lies right here at home — with the dentists who participate in the Canadian Dentists' Insurance Program's (CDIP) long-term disability insurance plan. Of all dentists who currently have a long-term disability, 20 per cent are away from their practice because of a mental or nervous problem. This represents the second largest single reason for claims — second only to back problems.

This high number of stress-related claims has a direct impact on the plan's "experience" — es-

entially how much has been paid out for claims. Of course, the higher that amount, the higher premiums must be for all participants in the plan. As a result, it is in all dentists' best interest to try to eliminate stress-related problems. Happily, in many cases it is not all that difficult to reduce stress.

First it is important to understand the roots of stress. One person with a rare opportunity to gain insight into this problem is Rob Weatherley. As a benefits representative for Prudential Group Assurance, he visits dentists once they go on long-term disability insurance — including those insured by CDIP long-term disability insurance.

"I usually sit down with the dentist for about an hour to discuss the claim and claim-related issues," Rob says. "It's basically an exchange of information. They tell me about their present situation, and sometimes the background. And I tell them about the disability policy and different avenues for help."

Rob Weatherley has noticed certain patterns among dentists. "There's definitely a character trait in common with many who are on disability resulting from stress," he notes. "It's perfectionism. And perfectionists tend to be more intense people, as opposed to laid back."

Causes Of Stress In Dentistry

By definition, stress involves a disruption to your normal physical or mental state, triggered by any negative situation. This disruption

must become tremendously serious before a dentist must actually leave his or her practice because of it. So what exactly leads to stress reaching such severe proportions?

"A phrase I hear a lot from dentists is 'getting on a treadmill,'" Rob continues. "They're very focused on dentistry — working long hours, becoming consumed over paying bills. There's a lot of pressure. Dentists are providing a health service and running a business. They have a high overhead and are always concerned about their patient load."

It's easy to see how dentists can be prone to stress. Experts say symptoms show up in any number of ways — feeling anxious or depressed, increased drinking, general fatigue, and such physical problems as insomnia, ulcers and heart problems.

"If these people reacted to their problems at an earlier stage, quite likely they wouldn't be on disability now," Rob comments.

"But they don't see the stress building — they're caught on the treadmill. And by the time they realize there's a problem it's too late."

Certainly CDIP insurance has helped many dentists get back on track when they were beset by stress-related problems. But what could these dentists have done to prevent these problems? There are a great many stress management techniques. Choosing the appropriate one — or ones — for you will depend on the source of stress and personal preference.

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Although this article can't recommend what's best for you, according to some experts, stress management techniques fall into four categories.

The first category is addressing the root cause, which in this case involves practice management. You have to pinpoint what aspects of your practice are causing you stress, then take action to solve the problems.

The psychological approach is the second category. The key to this approach is understanding that you can never eliminate all negative events, but you can control how you react. It involves changing yourself — on your own — or getting help specific to your situation, such as taking an assertiveness training course.

Next is the physical approach, including regular exercise, improved nutrition and relaxation management. These techniques work two ways: as symptomatic relief they calm you; as a preventative measure they increase your re-

sistance to potentially stressful events.

Finally, the social approach. This can involve socializing, since maintaining a balanced life goes a long way toward lowering stress — instead of being so "focused on dentistry," as Rob Weatherley observes. It can also involve talking to someone — a friend, family member or a therapist.

You can also seek the assistance of a fellow dentist or professional. Every province in Canada — through the provincial dental association or licensing body — has a program that offers support on a strictly confidential basis.

Stress in itself is not disabling. But if you are unable to manage your stress, you may develop symptoms so severe you are unable to work. At this point your insurance can help you deal with the financial burden of disability. But ideally the best solution for everyone — on a personal basis and as a member of organized dentistry — is to head stress off before it stops you from living life to the fullest. ■



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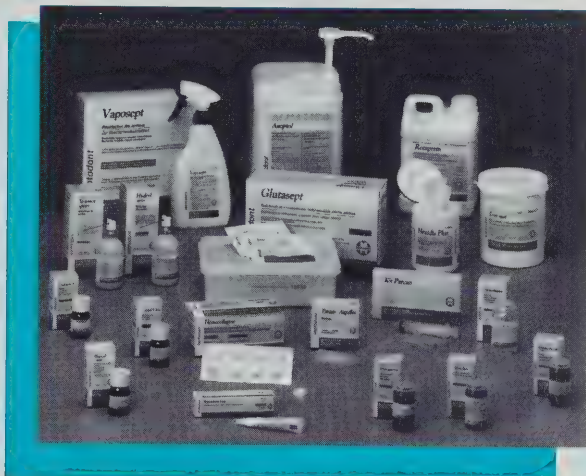
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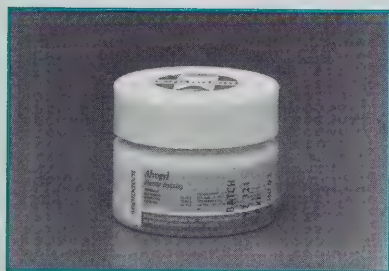
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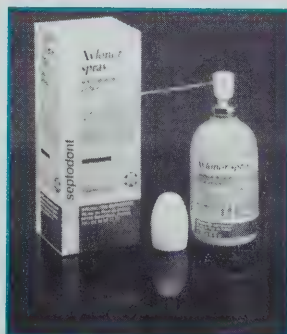
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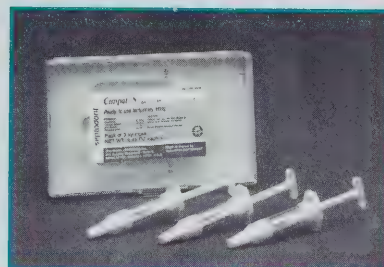
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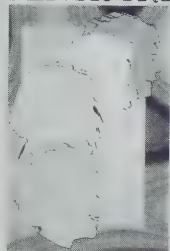
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GERIATRIC DENTISTRY



Dr. Saul Kamen: A 50 Year Odyssey Through Geriatric Dentistry

P. Ralph Crawford, BA, DMD

Dr. Saul Kamen of Long Island, New York, has dedicated over 50 years of his life — as a student, lecturer, leader, and advocate — to the cause of geriatric dentistry. In fact, when it comes to dentistry for the elderly, there is scarcely a major meeting, podium or journal that Dr. Kamen has not been involved with in some capacity. Small in stature, but large in heart and effusing abundant gentle humor, he draws attention at any gathering, partly because of his enthusiasm, but also because of his knowledge of the older dental patient.

Journal: Dr. Kamen, how, why and when did you become interested in geriatric dentistry? We understand your father was a dentist. Did he influence your direction in any way?

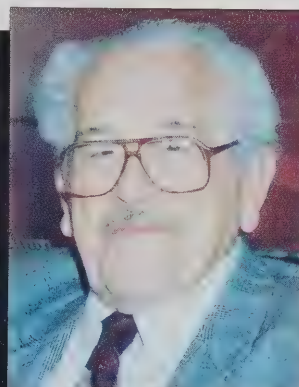
Dr. Kamen: Yes, my father certainly was an influence in shaping my directions in dental practice. A refugee from czarist Russia in the turbulent period at the beginning of this century, he emigrated to the United States and earned his dental degree in 1917. My earliest recollections are of wandering through his office with my twin brother, listening to the classical music he always kept on the radio while he worked, and observing his competence and compassion as he treated his patients. He was certainly a role model, and I always knew that I had to follow in his footsteps, particularly in trying to

emulate the humanism he combined with the love of his profession.

Journal: Are we correct in understanding that early in your career you had a great interest in treating pediatric patients, not seniors.

Dr. Kamen: In retrospect, I think I learned from my father the patience and empathy — so necessary to treat children — early in my practice, beginning in 1940. I was also fortunate to have a brother-in-law as a partner who encouraged this aspect of our practice. At that time dentistry for handicapped children was in a somewhat primitive stage, but we readily accepted such patients and learned, on the job, so to speak, about the challenges of managing patients with mental retardation and developmental disorders.

Out of this experience, plus concomitant self-education in several postgraduate courses in special patient care, I accepted a position as pedodontist-in-charge at the Long Island Jewish Medical Center in New Hyde Park, New York, first on a voluntary basis and later salaried. Because I maintained a private practice at the same time, I discovered there was a natural partnership between pedodontics and gerodontics. This is what ultimately led me to accept the concurrent position as chief of dental service of a 527-bed skilled-nursing facility, which was affiliated with the Medical Center and which opened in March, 1972.



I discovered there was a natural partnership between pedodontics and gerodontics.

It is this merger between dentistry for the developmentally disabled younger patient and the compromised elderly population which accounts for the transition from pedodontist to gerodontist.

Journal: Were you one of the founding members of the American Society for Geriatric Dentistry (ASGD)? It seems to us that at one time or another you have held every office in the organization and to this day never miss a meeting.

Dr. Kamen: At the risk of a paternity suit, I must demur from the erstwhile designation as a father of geriatric dentistry, but immodestly

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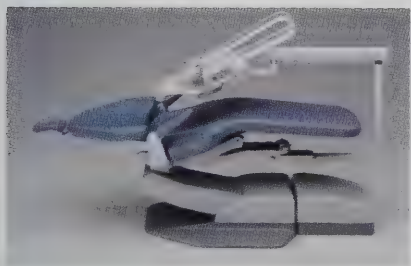
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admit that I served as one of the obstetricians at the delivery. The biological and historical father was Dr. Alfred Elfenbaum, who had the prececence to recognize the greying of the American population and formed the ASGD in the early 1960s.

The ASGD was then and still is the only organized arm of the dental profession dedicated to the advancement of oral health care for elderly persons. Its consistent programs of scientific and clinical dentistry, as well as its advocacy role in making dental care accessible to the under-privileged and underserved elderly, gave me the tools to hone my clinical and educational skills, and I have been a devoted member since 1968. I still preach that it is difficult to practise geriatric dentistry in any of its various forms without membership in the ASGD.

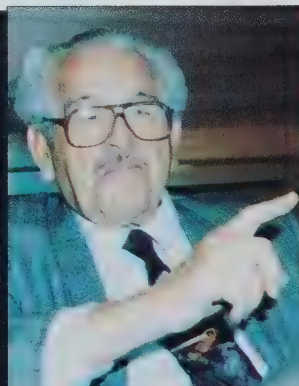
Assuming responsibilities and rising in the ranks of ASGD as I did, resulted in my assuming the presidency in 1981, and was predominately an individual decision arising from my feeling that one's social and moral values — and rewards — justify their existence on the planet earth. Evidently my colleagues north of the border are aware of this, because Canadians Dr. Norton Simon and Dr. Erwin Lightman are past-presidents of ASGD and your *Journal* editor, Dr. Ralph Crawford, just stepped down after serving as a member of ASGD's board of directors for seven years.

Journal: Can you tell us about your involvement with the Jewish Institute for Geriatric Care at New Hyde Park in New York. We understand it was one of the first locations to offer a residency in geriatric dentistry.

Dr. Kamen: Dr. Leon Eisenbud, an outstanding pioneer in hospital dentistry and the chairman of the department of dentistry at the Long Island Jewish Medical Center, invited me to head the service at the Jewish Institute of Geriatric Care to be opened in March 1972. For two years prior to its opening, we planned the innovative design and program of the dental facility. The feature that was most attractive and which compelled my acceptance

was the goal of establishing the first geriatric/general practice dental resident training program in a teaching nursing home in the United States. It was the first such program to be granted accreditation by the American Dental Association, in 1975.

In addition to this postgraduate training program, the dental service quickly formed affiliations with several dental schools on the eastern seaboard, which sent senior students on rotations. Periodically, we also organized continuing education courses which attracted dental professionals from all over the continent. Although I "retired" as chief in 1987, these programs, by and large, are still extant, and it is a pleasure to report that many of



I still preach that it is difficult to practise geriatric dentistry in any of its various forms without membership in the ASGD.

the participants in the institute have become outstanding leaders in geriatric dentistry.

Journal: The demographics of the elderly are almost alarming. What do these changing demographics mean to dentistry?

Dr. Kamen: I am not quite sure that I agree with the term "alarming." I am personally delighted that the numbers and the life expectancy

are increasing, considering the alternatives. However, there is no question that the projection of exponential population growth of the elderly in the next several decades poses difficult economic, social and political, challenges for society in general, and has specific implications for oral health care.

In the U.S., the most definitive survey of the dental status of the elderly, performed by the National Institute of Dental Research (NIDR) in 1985-1986, revealed that while there is a dramatic reduction in the rate of caries in children, elderly persons 65-75 years of age suffer three times the rate of cervical caries demonstrated by a group of workers 47-65 years of age. In terms of periodontal disease, although the elderly are retaining their natural teeth for a longer period of time, they pay a price in the increase in gingival recession, gingivitis and significantly higher rates of pocket formation. This survey also showed that despite a reduction in the overall rate of edentulousness in the past few decades, of those over 65 years of age, 42 percent have lost all their teeth.

Given the fact that many of the elderly in the U.S., particularly the poor, minority, and rural-dwelling, lack access to dental care, it is a safe assumption that there is a mounting backlog of unmet dental needs which will have to be addressed as we approach the 21st century.

Journal: Does chronology really have much to do with geriatrics? We have heard you refer to three distinct categories of elderly.

Dr. Kamen: At this point, an epidemiological caveat is in order. Just as aging is not a monolithic phenomenon, so we must consider how variations in the different cohort categories affect oral rehabilitation.

The 65-75 year age group, those who are relatively healthy, we could call the "go-gos." They will have the highest number of retained natural teeth, but conversely the greater incidence of caries and periodontal disorders. With the increase in life expectancy and economic power (in the U.S. this group has a mean asset worth of

\$125,000 per family compared to \$60,000 for younger families), they should offer a fertile market for sophisticated dental care. The 75-85 year cohort, which we could call the "slow-gos," have accumulated more medical problems, a greater number of pharmaceutical regimens, and a higher rate of edentulousness.

The 85-plus age group, the oldest, and whom we could refer to as the "no-go" elderly, is multiplying at three times the rate of the preceding age cohorts. They are by far the most debilitated and medically compromised, and constitute the bulk of the institutionalized population. Although some have proven viable candidates for such sophisticated therapy as implants, persons in this group offer the greatest challenge in the decision making process of treatment planning.

In the final analysis, each elderly person is a unique individual and must be judged on his or her own merits.

Journal: Can we compare the attitude toward dentistry of the geriatric of today versus that of the baby boomer who will be a geriatric in the 2011? Are we coming into a new group of enlightened geriatrics?

Dr. Kamen: In 1989, the University of Michigan made geriatric dental history when it offered the first continuing education course in geriatric dentistry on the North American continent — "Orthodontics for the Geriatric Patient." That certainly constituted a recognition that the elderly are more concerned about their appearance and are seeking cosmetic dentistry. It is a far cry from the fatalistic concept that the elderly are pre-ordained to lose their teeth, as expressed by William Shakespeare in *As You Like It* when he called aging, "mere oblivion — sans eyes, sans teeth, sans taste, sans everything."

Despite some objectionable stereotyping of the elderly, television and the movies have hammered into our future generations the importance of a beautiful appearance of the mouth and how a fluoridated lifestyle can help retain their natural teeth.

Yes, I believe the elderly as a group have a more positive attitude toward dental care and that dentistry is going along with the geriatric current.

Journal: We hear a great deal about the "busyness" problem today. Will — should — the growing geriatric population affect the dental economics of tomorrow? How do we encourage the dentist who has spaces in his or her appointment book to become more involved with the elderly? How can they better market themselves?

Dr. Kamen: The first prerequisite in marketing the services of a dentist to geriatric patients should be in elevating his or her skills — attitudinal, cognitive and clinical. Unlearning some old habits and shibboleths, and adapting to new approaches to therapy geared to the effects of aging on the dentition, will be an exciting experience in and of itself. But it can be an exercise in futility, with no patients in the chair.

There are many opportunities to ethically utilize newly acquired skills, but they may require some initiative and a dose of assertiveness in the implementation. For example, there is hardly a community today which does not have a senior citizen group, and which would not welcome a lecture on oral problems and self help. Many local papers welcome educational columns submitted voluntarily by professionals, without touting their own merits. Word of mouth, pardon the pun, is still the best way of encouraging and referring of patients, and evidence of a commitment to geriatric oral health care, such as a certificate of fellowship in the ASGD, is sure to attract attention. And, of course, contributions to the scientific literature will help establish the credentials of the would be geriatric dentist.

There is yet another avenue to explore for the dentist who lacks "busyness" on the appointment book. I am referring to the new modality of portable dentistry, which has been enriched by recent advances in the technology of dental equipment. I am personally familiar with several young dental

professionals who pool their finances and purchase complete equipment, costing around \$16,000 to \$20,000 U.S., which fits neatly into the trunk of a car. They have established contracts with nursing homes, congregate homes for the disabled, private homes and institutions. They find this to be both personally and financially quite rewarding.

Journal: Do you believe the elderly avoid the dentist because "it costs too much"? Or is this just another myth?

Dr. Kamen: I do believe the primary factor in the low utilization of dental services by the elderly is the cost. In fact, some studies reported in our literature indicate a positive co-relation between categories of income and number of visits to the dental office within all age brackets.

But there is another factor which often impacts on the utilization of dental services by the elderly — the perceived need versus actual dental need. In a research study that I participated in several years ago, we reported a huge discrepancy in the dental self-image of elderly persons and the prevalence of dental abnormalities. Perhaps this is an indication that we have to teach older patients how to perform an oral self-examination.

I would also suggest that across geographical boundaries, lifestyle values play an important role in the readiness of older individuals, as well as the younger population, in seeking dental care. There are still too many people who prefer to spend their money on cigarettes, video movies, and automobiles than on their dental health.

Journal: Dr. Kamen, let us talk a bit about the actual treatment of the geriatric patient. What do you think are the greatest problems and challenges?

Dr. Kamen: I have often said that geriatric dentistry is more caring than curing, more touching than technology, and more compassion than cavities. Apart from the common disorders of caries and periodontal disease, the elderly person

has a greater vulnerability to soft tissue pathology.

I always ask the older patient to bring all the drugs they are taking, prescribed or over-the-counter, on their first appointment. The dentist should be able to recognize the medications which interface medical problems with dental management.

Patients with Alzheimer's disease and related dementias, as well as depression, may be on psychotropic regimens which will not only promote caries, but also result in involuntary spastic movements that make it difficult to perform restorative or prosthodontic therapy. Most elderly patients, fortunately, are amenable to routine oral rehabilitation, but a significant percentage require modifications of therapy dictated by their physical and mental limitations.

Journal: What is being done to educate our dentists of tomorrow about geriatric dentistry? Is there enough emphasis being placed on geriatric dentistry in our university curricula?

Dr. Kamen: I have been wrestling with those questions for the past two decades, and I believe I can report some progress. Early in the 1980s I had the opportunity to address the faculty of a well-established dental school in an attempt to incorporate gerodontics in their undergraduate curriculum. At that time, I met with a phenomenon I call the academic ABC's — apathy, backwardness, and cynicism.

Shortly afterwards, probably as a result of the infusion of government awards and philanthropic funds, I was gratified to observe that most dental schools in the U.S. did introduce substantial gerodontic didactic material into the lecture schedules, and a modicum of emphasis on clinical experience with older patients.

I would say, therefore, that there has been a qualitative and quantitative improvement in geriatric instruction at the undergraduate level, especially since the production of a comprehensive manual on geriatric dentistry by the American Association of Dental Schools — for which I immodestly take some

credit as one of the participants on the Task Force engaged in its publication.

At the same time, I must confess a strong prejudice that there cannot be true geriatric training without a significant exposure to the dental service of a teaching nursing home, and I believe that schools of dentistry in the U.S. and Canada must form such affiliations.

On the postgraduate level in the U.S., we have seen some progress, but I must sadly report that one of the major resources for advanced training in geriatric dentistry has recently been curtailed because of a lack of funds. I am referring to the U.S. Veteran's Administration Geriatric Fellowship Training Program, a project which for almost a decade produced a cadre of young gerodontists who were a breath of fresh air to the geriatric movement.

Also in the U.S., we have recently enacted a government program called the Faculty Training

Program in Medicine and Dentistry, now based in the medical department of 19 major university centres, and in which the inclusion of postgraduate dental trainees is mandated. I should also take note that many of our U.S. hospital resident training programs have expanded the opportunities for advanced education by rotating their trainees to affiliated long-term care facilities.

Are the training programs I just referred to enough? Of course not! Only if there is a clamor by professionals in the U.S. and Canada for more knowledge in coping with the challenges of geriatric dentistry, and by the elderly consumers and their advocacy agencies, will we see the educational reforms required to meet the oral health needs of the projected population of elderly in this country — 20 per cent of the total population in the next century. ■



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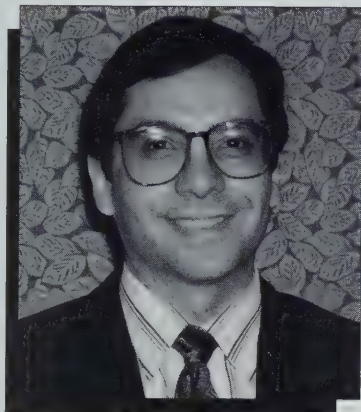
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Dentistry For the Nursing Home Resident: How To Begin Or Improve Your Oral Health Care Program

Barry W. Ceridan, DDS

ABSTRACT

This paper identifies the steps a general practitioner should follow to initiate or improve an oral health-care program in a nursing facility. The areas to be considered in the planning stages are explored, as well as the types of services that may be performed and the fees that the practitioner should charge. The paper provides a general overview of nursing home oral-dental services. Problems, a solution, a total quality management process for initiating the services, some questions that practitioners will need to ask and answer themselves, and a plan of action are discussed.

SOMMAIRE

Dans cet article, on indique les mesures qu'un praticien général doit prendre pour mettre en oeuvre ou améliorer un programme de soins bucco-dentaires dans une maison de santé. On y étudie les points à considérer dans la planification ainsi que les différents services à offrir et les honoraires à exiger. On y présente également un aperçu général des services bucco-dentaires dans les maisons de santé. Enfin, on y parle des problèmes, d'une solution pour les résoudre, de la gestion de la qualité dans ces services, des questions que le praticien doit se poser et auxquelles il doit répondre, et d'un plan d'action.

On a November evening in 1977, I received a telephone call from a woman who was extremely anxious about her mother. Mrs. Gray, 84, had just been released from the hospital where she was being treated for lung cancer. Unfortunately, her maxillary denture had been accidentally thrown away. While at the hospital, she had removed her denture, wrapped it in a tissue and placed it on her meal tray, because it was hurting her. As the hospital did not have a policy of regularly inspecting the meal trays of older persons for dentures or other items, the denture was discarded.

Mrs. Gray's daughter had heard from a local social worker that I treated older persons in my office. She asked if I would make a new denture for her mother while Mrs. Gray was in the nursing home where she would be placed for a short period before being released to the daughter's home. My response was that I had no portable dental equipment and very little experience in performing dental services in a nursing home or homebound situation. However, I agreed to visit Mrs. Gray, and said that I would try my best to fabricate a new denture for this woman, whose only desire was to enjoy her meals and have the dignity of an improved appearance for the remaining days of her life.

Today, I can honestly say that I will never forget the experience of working with Mrs. Gray, nor the personal satisfaction I felt when I was able to improve the quality of her life. It was the beginning of a 16-year career of providing oral health care services to patients in their homes and at nursing homes, and thereby improving the quality of their lives.

The Problem

Oral health care for the long-term chronic care resident has been largely absent until quite recently. Historically, the importance of routine dental care and daily oral hygiene for the nursing facility resident was relegated to the back burner, largely as a result of prevailing myths such as the notion that it is normal for older adults to lose their teeth. Lack of knowledge regarding the importance of oral status and its relationship to general good health is another reason that the elderly have often been dentally and orally neglected by long-term health care practitioners, although the biggest culprit contributing to this oral neglect may be insufficient funding.

Fortunately, priorities are changing. We now know that oral health care for the elderly is not a luxury but a necessity. Dental professionals, as well as other health-care providers, are now actively seeking to address this neglect.¹

JOURNAL

May/
Mai
1994
Vol. 60
No. 5

For years, I have tried with mixed success to develop a nursing home dental program that would improve the oral health of the nursing home resident. Frequently, I was told by the nursing home administrator: "We don't have any dental problems at our nursing home. I am not going to institute any dental program until the federal or state government tells me I have to."

But in a few instances, I have been asked to visit nursing home facilities to begin an oral health-care program, because the staff saw the need and had the desire to improve the quality of the residents' lives.

A Solution

Three years ago, I read *The Deming Management Method*, an innovative book by Mary Walton (Putnam Publishing Group, 1986). This book, as well as three Lloyd Dobbins' programs on "Improving the Quality Of Your Business," broadcast on public television, changed my entire outlook on providing services to all my patients. Today, I suggest that anyone interested in providing services to older persons (or younger ones) should consider using the following techniques:

- Establish a vision or mission statement for yourself.
- Develop guiding principles that will set the course for your journey.
- Embrace goals that will improve the quality of life of the patients you want to serve.
- Write down your oral health-care program on paper — completely and in detail.
- Establish and implement your plan of action.

The Process

A second book that I've found useful is *Bringing TQM (Total Quality Management) on the QT To Your Organization*, by Hedy Gruenebaum Abromovitz and Les Abromovitz (SPC Press Inc., 1993). This is a very simple book, with great examples and powerful suggestions on how to improve the quality of whatever business or service you wish to deliver. I have

instituted their very simple suggestion of Plan-Do-Check-Act² in my practice:

- **PLAN** your oral health-care program.
- **DO IT** — implement your program on a very small scale by volunteering to perform some oral examinations in one wing of a nursing facility to obtain data and information.
- **CHECK** — measure or analyze the results and understand that you will always make adjustments.
- **ACT** on the new information.

It's important to recognize that the Plan-Do-Check-Act system is a circular spiral process. Like a DNA Helix, it is always heading upwards with continuous improvement and input from many sources. One of these sources is education, or increasing your "profound knowledge," as Dr. Edwards W. Deming, the late leader of the quality movement, used to say in his four-day lecture series.

Questions The Practitioner Must Ask

Before initiating any health care program, the practitioner must ask him or herself a number of important questions: Is there a need for this program? What kind of services do these residents need? How can they pay for the services? What kind of supplies and equipment will I need? Who will perform the services? What kind of education must I obtain for myself, the nurse, the nurse's aide, the nursing facility staff and administration, and the residents? How will I communicate this information to these people and, where necessary, the residents' guardians or power of attorney? When will I provide these services and how much time do I wish to devote to this project? What will I charge for these services? Will I charge a transportation fee or visit fee? What are the national, provincial, and local laws that govern oral care services provided to nursing home residents? How do these laws translate into payment for the services rendered? What kind of personal rewards or financial gain do I wish to earn by visiting nursing home residents? How do I prevent

personal "burn out" and cope with the loss of patients when they die?

Practitioners will probably need some help to answer these questions. However, regardless of the answers you formulate, you will need to "decide what you want to do, be responsible and follow through, check it, and then act."

Plan Of Action

Your plan of action will likely include eight or more subject areas:

1. Laws within the state, province, or nation.
2. Contact with the nursing facility staff.
3. Personal rewards and burn out.
4. Oral hygiene program.
5. What type of dental services are needed.
6. Providing the services as the attending dentist.
7. Continuing education.
8. Barriers which hinder services.

1. National, State and Provincial Laws

Although the national laws regarding what oral-dental services are available to nursing home residents and the elderly may be clearly stated, the actual implementation of the relevant rules and regulations may be non-existent. Nursing facilities are surveyed by licensure and regulatory organizations within each state or province. Practitioners need to determine what these rules and regulations are before they initiate any contact with the nursing facility administration.

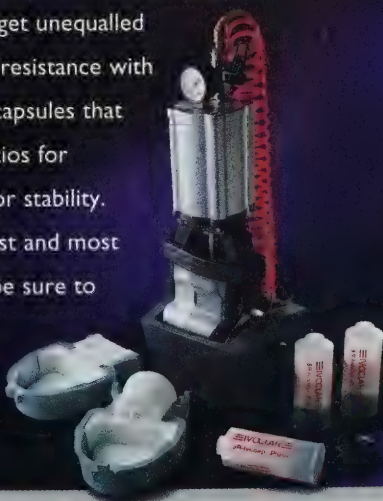
2. Contact With The Nursing Facility Staff

Contact with the nursing facility staff will include communication with the administrator, the director of nursing, the social worker, the nurse's aide and the medical director. You may also come into contact with a physical therapist, nutritionist, pharmacist and occupational therapist. Before you make an appointment to visit the

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administrator, director of nursing and/or social worker, it is essential to have your entire program written down, and that you understand how all aspects of the program will work. You will make a poor impression if you are asked a question and you don't know the answer. The best approach is to send nursing home staff an outline of your program, in triplicate, ahead of time. A subsequent formal presentation will be more impressive if you have prepared a slide presentation of your oral health-care program and are well organized.

To prepare your presentation, you should:

- a) know what your fees are and how you will process your services (see triplicate form);
- b) write a contract, which your attorney can help you to prepare;
- c) be willing to suggest that you become part of the facility's quality assurance program;
- d) develop an in-service education program for the nurses and nurses aides. (But don't sell yourself short. Charge a fee for your in-service time and make it part of your contract.);
- e) realize that if you become the facility's dental director, you will be asked to take on many more responsibilities and a greater time commitment. You should be paid accordingly, just as the medical director is on a retainer fee. Otherwise you may only wish to be the attending dentist who provides services to the residents;
- f) understand the law, because the administrator will surely know what services he or she legally has to provide to the residents. You may want to cite the appropriate laws in writing, as this will demonstrate that you know what you are talking about. Also, ask how often the survey or accreditation teams visit the facility. Keep your presentation simple and short, and let the administrator know that you are the expert. The facility will want you and your services, but they'll probably ask you to volunteer your time, energy, and money. Don't sell yourself short. Understand what you and what your time are

worth. Set your fees accordingly and fairly.

3. Personal Rewards and Burnout

My years of providing oral health-care services to nursing home residents have given me many personal rewards. I have made many friends and have spent hours talking to them about their lives. I have learned many things about life and death from these conversations. But it's not always easy.

If you follow in my footsteps, remember that there will be sad times after a patient dies, and that you may need some help to deal with this. Working with organizations such as Hospice and the Visiting Nurse Organization will help. In addition, I've found that working with these types of groups has given me greater visibility in the community, which has led to referrals to my general practice. Don't take on too many nursing homes in the beginning, though, or you'll be too overwhelmed.

4. Oral Hygiene Program

Your oral hygiene-prevention program should include your in-service program as the basis for training and educating nurses and nurses' aides. Don't forget to include your hygienist in this process. She or he will be a tremendous help in educating the nursing facility's staff. You may want to design your own oral hygiene program. Another option is to use the hygiene program outlined in *Developing a Dental Program for the Nursing Facility: A Manual for Dental Office Staff*, published by the American Society for Geriatric Dentistry and UTHSCA in 1993, and edited by Dr. Michele Saunders, DMD. This program offers an excellent video for nurses' aides, outlining oral hygiene for the nursing home resident; a separate slide and script presentation for nurses and nurses' aides, with a pre and post test; and an *Oral Care Handbook*, which can be purchased separately (see references for more details).

5. Type Of Dental Services

The types of oral dental services you wish to provide will determine your equipment, supply, and transportation needs, as well as where you ultimately perform the services, and which universal precautions-infection control procedures you will employ. The types of services provided, such as emergencies or examinations only, or denture and partial denture reline services, will definitely determine where you undertake this work. Do you wish, for example, to have nursing home residents brought to you at your office? We often suggest this for all ambulatory and wheel chair residents. Our office is accessible. It's important to be aware of the laws in your area governing transportation and scheduling appointments, as well as who is responsible for arranging these services. Please note that you may not be able to use the nursing home's beauty salons as dental treatment areas, due to infection control rules and regulations.

6. Providing Services As the Attending Dentist

As the attending dentist providing oral health-care services to nursing home residents, you must be well organized and communicate with all the interested parties.

You must:

- a) Obtain a written consent form signed by the resident, guardian, or power of attorney. This will give you permission for the initial and emergency oral examination. The nursing facility staff will obtain the patient's signature on a consent form when he or she initially enters the facility. Make sure you approve of this document. Have your home visit and examination fees listed so there is no doubt about what the fees will be. From this point on, you should know who will be making the financial decisions for the resident. However, the words "responsible party" should not be relied on when seeking permission for treatment or payment. This individual may not be able to provide you with either, which can cause real headaches for you later. The facil-

ity's finance person or social worker can help you with this.

b) Organize your records. This can be achieved with a triplicate form on NCR paper of different colors. The form will serve as your dental chart, information page, and continuation notes page. It will also contain your treatment or care plan and a space for fees. There will be three pages in total, which should not be removed from the resident's medical chart. Ideally, the top copy of each page will remain in the medical chart, the middle copy will go to the person who makes the legal decisions on the resident's health care and pays for treatment, and the last copy will be filed at your office. I must stress that you should follow the same organizational procedures for your nursing home patients as you do for your general practice office patients. For example, you shouldn't charge different fees for the same procedure just because your patients are in a different location. However, it is reasonable to charge a home- or travel visit fee. Establish what your time is worth for travel, set up, consultation with all parties and writing treatment notes, and charge a fair fee for this time. Good communication and record keeping will achieve a high rate of treatment plan acceptance and prove profitable — with a 99.9 per cent collection rate.

c) Your referrals to specialists should remain the same for your nursing home and general practice patients. Consultation with the treating physician is very important in both cases. It's important to read the patient's medical chart, so that you are aware of his or her medical history. It also pays to ask for the nurse's assistance, because she will know your patient the best.

7. Continuing Education

Educate yourself. There are continuing education courses available to help you. Learn about the American Society for Geriatric Dentistry. It hosts a three-day annual session in Chicago each spring that offers a variety of courses, as well as a one-day con-

tinuing education program, held just before the American Dental Association (ADA)'s annual meeting. Some dental schools offer their own programs. You may wish to consider starting your own study club with interested dentists in your community. Or reading articles in *Special Care in Dentistry*, the journal of the American Association of Hospital Dentists, the Academy of Dentistry for the Handicapped, and the American Society for Geriatric Dentistry. Or you may want to obtain a copy of *Developing a Dental Program for the Nursing Facility: A Manual for Dental Office Staff*.

8. Barriers Hindering Services

There are a number of barriers that will hinder your ability to provide services in the nursing facility:

a) A lack of money to pay for the services (the most common problem). If you provide services in a private-pay nursing care facility, your patients may have a higher education level and may have sought dental care most of their lives. They most likely will continue to seek dental services. If the patients receive provincial or national assistance, there may be only a minimal amount of services paid for from the public purse. Here you must be creative with the social worker to find funds for treatment services. It is not always easy.

b) The nursing facility administrator may not see oral care as a priority, and may only seek dental services for residents when told to do so by the accrediting agency or licensure organization. You may have to educate the nursing facility administration of the need for dental services.

c) Your own time commitment and desire to perform these services. You must learn to be adaptive, creative, patient and a good listener.

d) You must be able to follow through with what you say you will perform.

Final Encouragement

The personal rewards I've enjoyed by providing oral health-care

services to nursing home residents have far outweighed the financial ones. Nevertheless, providing services in nursing facilities can supplement your office income. There are some dentists who only provide services in nursing facilities and do not have an office. I know they are earning a decent income with hard work. Their business overhead is 15 to 30 per cent.

Whichever approach you choose, the basic methods to consider are the same: Decide what you want to do. Establish a Mission. Decide on Guiding Principles. Set your Goals. Plan it. Implement it. Check it and act on it again. Organize your notes and time. Communicate your treatment plans with options for treatment. Decide what your time and efforts are worth. Charge fair fees. Get some personal help if you need it and educate yourself.

I asked a 96-year-old man to tell me a story one day while I was fabricating dentures for him. With tears in his eyes, he told me of the day when, as a nine year old, he had saved his father from drowning while they were fishing off the New England coast. I will never forget that story. ■

Dr. Barry W. Ceridan maintains a general dental practice in Louisville, Kentucky. A past-president of the American Society for Geriatric Dentistry and the chairman of the Federation of the Federation of Special Care Organizations in Dentistry, he presently visits three nursing facilities one day per week. For more information, contact Dr. Ceridan at 455 S. 4th Street, Starks Building, Suite 859, Louisville, Kentucky, U.S.A. 40202, or call: 502-587-7744.

Developing a Dental Program for the Nursing Facility: A Manual for Dental Office Staff is available from: OBRA Dental Manual, ASGD, c/o STGEC, 7703 Floyd Curl Drive, San Antonio, TX 78284-7921.

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Changes In Utilization Of Dental Services Of Alberta's Universal Dental Plan For the Elderly

G.W. Thompson, DDS, M.Sc.D., PhD, FRCD(C)

D.W. Lewis, DDS, DDPH, M.Sc.D., FRCD(C)

ABSTRACT

Since 1973, Alberta's dental plan for the elderly has made government-sponsored, premium-free comprehensive care by dentists and denturists available to all residents of the province over age 64. Details on the numbers and types of different services provided were previously unavailable from the annual reports. However, an examination of the plan's six-million records, covering nearly 260,000 different patients from 1978 to 1992, has now made it possible, for the first time, to conduct a detailed analysis of these dental services.

Many time-related changes have occurred in the types of services provided. The number of removable prosthodontic services declined from 14 per cent of all services offered by dentists in 1978-79 to five per cent of these services in 1991-1992, but the services provided by denturists increased by a factor of four. The relative number of surgical and restorative dentistry services offered by dentists also declined. Preventive services grew modestly, but periodontal services grew dramatically from three per cent of all services provided by dentists to 22 per cent. These shifts in services from prosthodontics, restorative dentistry and oral surgery to preventive and periodontic services have important implications for the planning and administration of dental plans for the elderly.

SOMMAIRE

Depuis 1973 en Alberta, le régime des soins dentaires pour les aînés subventionné par le gouvernement permet d'offrir aux résidents de la province âgés de 64 ans et plus des soins de dentisterie et de denturologie tout à fait gratuitement. Auparavant, on ne disposait pas, dans les rapports annuels, de données touchant les services offerts et leurs nombres. Cependant, grâce à une étude des quelque six millions de dossiers rédigés pour les presque 260 000 patients traités de 1978 à 1992, on peut pour la première fois faire une analyse complète de ces services.

Avec le temps, de nombreux changements ont eu lieu dans les services offerts. Ainsi, pour tous les services offerts en dentisterie, les services de prothèse amovible sont passés de 14 p. cent pour l'année 1978-1979 à 5 p. cent pour l'année 1991-1992, alors que les services offerts en denturologie se sont multipliés par quatre. Le nombre relatif des services de chirurgie et de restauration offerts par les dentistes a également diminué. Par contre, les services de prévention ont accusé une hausse modeste et les services périodontaux une hausse spectaculaire en passant de 3 à 22 p. cent. La demande pour les services de prévention et de périodontie augmentant aux dépens des services de prothèse, de restauration et de chirurgie, ces changements dans les

services offerts sont de conséquence pour la planification et l'administration des régimes de soins dentaires à l'intention des aînés.

Introduction

Alberta's Extended Health Benefits (EHB) dental plan began in 1973, well in advance of current pleas for government to support affordable and accessible dental care for older people.¹ It provides comprehensive dental benefits to all Alberta residents 65 years of age and older, as well as their spouses and dependents. Since 1983, the plan has also provided dental services to 55-64 year old widows and widowers of defined low income, and their dependents. It is estimated that 85 per cent of those eligible to participate in the plan are over 64 years of age.²

The plan is funded entirely from provincial government revenues (eligible persons do not pay any premiums). Dental benefits are broad in scope, with extensive services available under each of the major treatment categories: diagnosis; prevention; restorative; endodontics; periodontics; removable and fixed prosthetics; surgery; and even orthodontics (presumably for young dependents). There are, however, some service and total payment restrictions. Payments on behalf of each eligible person are not to exceed \$960 (maximum

TABLE I
**Extended Health Benefits
Percentage Payment Of
the Alberta Dental Association's
Suggested Fee Guide**

Year	Percentage
1974	90.0
1975	90.0
1976	85.0
1977	84.5
1978	84.5
1979	84.5
1980	87.0
1981	78.7
1982	78.0
1983	78.0
1984	70.0
1985	67.6
1986	66.5
1987	64.7
1988	61.8
1989	59.9
1990	58.6
1991	55.2
1992	41.8
1993	40.7
1994	35.2

payments were \$1,200 prior to May 1, 1991) over two consecutive calendar years. Some other limitations are: one complete and/or partial denture or reset for each arch once every five years; one denture relined or rebase for any one arch once every two years; and prior approval for major orthodontics. In 1983, a limit of one diagnostic splint and no more than four occlusal adjustments for any patient in any 12-month period was imposed. Similarly, in 1990 diagnostic splints were removed as eligible service benefits.

Dental care is supplied by dentists and denturists in private practice. Denturists only provide complete dentures and related services such as relines and repairs. The participation of dentists and denturists has been very high. About 90 per cent of the licensed dentists

in Alberta have treated patients annually under this plan (1,278 dentists in 1991-92), and virtually all of the province's denturists have participated each year (204 in 1991-92).

About 45 per cent of the nearly 300,000 persons eligible to participate in the plan currently use it annually.² However, utilization over a two-year period is much higher, about 65 per cent.^{2,3} Each year, about 14 per cent of plan users attend denturists only and 73 per cent attend dentists only, while the remaining 13 per cent use both types of providers.²

Over time, more persons have been treated and more dental services have been provided under the plan.² Costs are also growing rapidly. However, between 1974 and 1991, the costs per eligible person only began to exceed the rate of inflation in 1986-87.

The fees paid to dentists by the plan have not increased regularly, and are now less than half of the fees suggested in the Alberta Dental Association's fee guide (Table I). In reality, this represents a significant decrease in fee levels from the plan's initial years. However, if dentists advise patients of their in-

tent prior to treatment acceptance, they can subsequently bill patients directly for the portion of their professional fees that are not paid by the EHB plan.

In the previous cross-sectional analysis of the annual reports for Alberta's EHB dental plan, it was noted that basic descriptive characteristics of the plan's users and utilization were unavailable.² These characteristics included the age and regional distributions of the patients, as well as the numbers, types and kinds of dental services provided annually to patients by participating dentists and denturists. In addition, it was impossible to evaluate the changes in use and utilization that were occurring over time. This more detailed cross-sectional study is intended to clarify some of these matters by the analysis of the actual EHB dental plan patient data base. These data are made available by Health Economics and Statistics of Alberta Health for research purposes.

Methods

About six-million record files, covering all of the nearly 260,000 different persons who had used the EHB dental plan from 1978/79 to

TABLE II
**Users Of the EHB Dental Plan By Age — 1978-79 to
1991-92**

Year	Number of Users by Age			Percentage In Each Age Group			
	<65	≥ 65	Total	<65	65-69	70-79	≥80
1978-79	9,185	39,339	48,524	18.9	36.7	34.3	10.0
1979-80	9,562	42,413	51,975	18.4	36.2	35.2	10.2
1980-81	9,883	46,488	56,371	17.5	36.0	35.8	10.6
1981-82	10,167	48,139	58,306	17.4	36.0	35.9	10.6
1982-83	10,233	50,747	60,980	16.8	35.6	36.4	11.2
1983-84	11,637	57,595	69,232	16.8	35.3	36.6	11.3
1984-85	12,564	61,107	73,671	17.1	34.5	37.0	11.5
1985-86	12,936	66,790	79,726	16.2	34.5	37.2	12.2
1986-87	13,681	74,015	87,696	15.6	34.2	37.5	12.7
1987-88	13,825	78,761	92,586	14.9	34.4	37.5	13.2
1988-89	13,784	82,084	95,868	14.4	34.4	37.6	13.6
1989-90	13,954	88,377	102,331	13.6	34.3	37.8	14.3
1990-91	14,068	93,633	107,701	13.1	33.8	38.7	14.3
1991-92	14,001	96,594	110,595	12.7	33.3	39.5	14.4

1991/92, were obtained from the Alberta government (Division of Health Economics and Statistics, Alberta Health). An algorithm was used by the government programmers to re-code the dentist, denturist and patient identification numbers to preserve anonymity. The data tapes were initially loaded on the University of Alberta's Amdahl mainframe computer. Data were subsequently transferred to an IBM PC, which has two 300 megabyte hard drives. A series of customized C language programs and the SPSS/PC+ software package were used to select and calculate the means and frequencies of the patient age and the provider and regional service data that form the basis of this analysis.

Since the data tapes for years prior to 1978 were unavailable, this annual, cross-sectional analysis does not cover the first four years of operation of the EHB dental plan. Even so, the need for brevity made it necessary to limit the data presentation here to the years 1978-79, 1981-82, 1984-85, 1987-88, 1990-91, and 1991-92. The data only refer to plan users, and not to those persons who were eligible to use the plan but did not do so.

Results

The age distribution of the persons who used the plan from 1978-79 to 1991-92 is outlined in **Table II**. In this 14-year period, the total number of users more than doubled. Although the numbers of those under 65 years of age who

TABLE III
Number Of Services Provided By Dentists and Denturists For Persons Over Age 64

Year	Dentist	Denturist	Total
1978-79	165,284	23,388	188,672
1981-82	206,896	28,671	235,567
1984-85	300,257	39,151	339,408
1987-88	439,125	71,862	510,987
1990-91	534,166	95,952	638,118
1991-92	510,691	93,474	604,165

were regular users of the plan grew each year, this age group has decreased from 19 to 13 per cent of the total number of users. The relative percentage of patients aged 65-69 has similarly decreased with time, while the group over 69 years of age has increased from 44 per cent in 1978-79 to 54 per cent in 1991-92.

Dentists performed 88 per cent of the dental services provided under the plan through 1985, although this was reduced to 86 per cent in 1987-88 (for the 12-month period from April 1 to March 31), and to 85 per cent in 1990-91 and 1991-92 (**Table III**). However, the total number of services provided by the dentists has increased greatly over time (**Table III**), from 165,284 dental services in 1978-79 to 510,691 in 1991-92.

The most striking change that has occurred is the decrease in the relative percentage of removable prosthodontic services (complete and partial dentures) that have been provided by dentists under the plan. As shown in **Table IV**, the

provision of prosthodontic services has declined from about 14 per cent of the total services provided by dentists in 1978-79 to just five per cent in 1991-92. In fact, the total number of removable prosthodontic treatment services provided by the dentists and denturists decreased from 24.7 per cent of the total services provided in 1978-79 to 21.8 per cent in 1981-82, 19.5 per cent in 1984-85, 20.1 per cent in 1987-88 and 1990-91, and 19.7 per cent in 1991-92.

The relative numbers for preventive services increased from 12 per cent in 1978-79 to 16 per cent in 1991-92. More strikingly, however, the relative amount of periodontal services provided by dentists and dental hygienists increased tremendously (**Table IV**). In 1978-79, just three per cent of the total services provided were for periodontal diseases, but in 1991-92 this had grown to about 22 per cent. At the same time, the relative number of oral surgical services has declined from 13 per cent in

TABLE IV
Per cent Distribution Of Dentists' Services Provided For Persons Over Age 64

Procedures	1978-79	1981-82	1984-85	1987-88	1990-91	1991-92
Diagnostic	29	32	31	29	29	30
Preventive	12	13	13	13	14	16
Restorative	24	24	23	21	19	19
Endodontics	2	3	3	2	2	2
Periodontics	3	4	11	19	22	22
Rem. Prosthodontics	14	11	9	7	6	5
Fixed Prosthodontics	2	2	2	1	1	1
Oral Surgery	13	11	8	5	5	5
Adjunctive	1	1	1	1	1	1

TABLE V

Per Cent Distribution Of Dentists' Services By Region For Persons Over Age 64

Region	1978-79	1981-82	1984-85	1987-88	1990-91	1991-92
Calgary	34	34	36	37	35	36
Edmonton	39	39	39	40	42	41
Northern Alberta	8	9	8	7	7	6
Central Alberta	5	5	5	5	5	5
Southern Alberta	10	10	9	8	7	7
Unclassified	1	1	0	0	1	1

1978-79 to five per cent in 1991-92.

The number of dentists' services are regionally distributed according to population size in **Table V**. The rank orders of the regional percentages are perfectly consistent for each year, from Edmonton (highest), then Calgary, Southern Alberta, Northern Alberta to Central Alberta (lowest).

Discussion

The participation of eligible users in the Extended Health Benefits program has increased from 26.5 per cent in 1978-79 to 33.2 per cent in 1984-85, and 43.9 per cent in 1990-91.² More than twice as many persons used the EHB dental plan in 1991-92 than did so in 1978-79, and those using it today are increasingly older. Once the plan has been used by an individual, a high continuity of use occurs, and this continuity is greater with the younger elderly rather than with the older elderly.³ Thus, the major growth in the number of users is not only due to the entrance of newly-eligible 65 year olds, but also to the regular attendance of past users.

There has been a large decline in the proportion of annual services attributable to the provision of complete and partial dentures by dentists between 1978-79 and 1991-92. However, denturists have increased their level of services in this area four-fold. As a result, the actual services provided to patients for complete and partial dentures by dentists, and complete dentures by denturists, have decreased from 24.7 per cent in 1978-79 to 19.7 per cent in 1991-92. These services include relines,

etc. and do not indicate a new denture for each service.

In effect, patients have fewer prosthodontic dental needs and are receiving more dental care of other types over time. There has been an increase in the proportion of periodontal services provided from three to four per cent in the early years to 22 per cent in the later years. This is the most dramatic shift in treatment services, and is consistent with the changes in patient age, retention of natural teeth, and the continuity of visiting patterns for dental care.

Two treatment areas where the provision of services decreased, relatively, during this time period, were restorative dentistry and oral surgery. The decrease in restorative dentistry services was slight, from 24 per cent to 19 per cent of the total services provided. However, the reduction in oral surgery services was from 13 per cent to five per cent. That is, fewer teeth required restorations or extractions.

Between 1978-79 and 1991-92, the total number of services provided by dentists increased three-fold. However, the number of users also increased by 2.5 times.

There was a four-per-cent drop in the total services provided by the plan between 1990-91 and 1991-92, despite a three per cent increase in the absolute number of patients over age 64. This is likely related to the May 1, 1991, decrease in the total allowable payments for dental services over two consecutive years, from \$1,200 to \$960 per person.

The shifts in demand from prosthodontics, restorative dentistry and oral surgery services to preventive and periodontal services have

important implications for the planning and administration of dental plans for the elderly. These data apparently reflect the changes that are taking place in society, with older adults retaining more of their natural teeth.

These findings, in combination with the aging of the population and the possible improving oral health status of older adults, have implications for shifts in the quantity and types of services provided. ■

Acknowledgment: This research is supported by NHRDP Grant 6609-1503 CD from the Department of National Health and Welfare, Ottawa, Canada. The data base was made available by the Division of Health Economics and Statistics, Alberta Health. The programming and data analyses were done by Mr. Andrew Folkins, Faculty of Dentistry, University of Alberta.

Dr. G.W. Thompson is a professor, chairman of the division of community dentistry, and acting chairman of the department of dental health care, faculty of dentistry, University of Alberta.

Dr. D.W. Lewis is a professor in the department of community dentistry, faculty of dentistry, University of Toronto.

Reprint Requests to: Dr. D.W. Lewis, Faculty of Dentistry, University of Toronto, 124 Edward Street, Toronto, ON M5G 1G6.

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82ND WORLD DENTAL CONGRESS • VANCOUVER OCTOBER 2ND TO 8TH, 1994

UPDATE • UPDATE • UPDATE • UPDATE • UPDATE

An Interactive Scientific Program



The FDI 1994 World Dental Congress will be held in Vancouver, Canada this October 2-8, 1994. The scientific program is a most integral segment to this Congress. It is also a very exciting part of the meeting. We have put together the most comprehensive scientific program which will incorporate over 100 lectures. These lectures will cover the most relevant topics to today's practitioner and dental team members.

The scientific program has been especially designed to be interactive. The hands-on courses encourage participants to handle materials, equipment and instruments while practicing the latest techniques in dentistry under the guidance of skilled clinicians. Limited attendance courses are designed to thoroughly review specific cases and procedures of importance to the entire dental team giving ample time for questions and discussion. Also, live-television presentations will benefit all practitioners as they view new techniques and procedures first-hand on live patients. Live-television presentations encourage viewers to ask questions of the clinician as he demonstrates the procedure. Simultaneous interpretation will be offered at a great number of our sessions enabling dental professionals world wide to learn together.

Table Clinics, Free Communications and Poster Presentations are also vital sections of the scientific program. These presentations involve interaction between the presenter and his audience as the presenter shares information, research and personal experience on a specific topic. Table Clinics and Free Communications include a question and answer period as part of their presentation.

Lecturers, experts in their field, have been chosen from the world over to demonstrate, teach and transfer their knowledge to the participants attending their sessions. Our goal is for every dental professional to not only broaden their scope of knowledge but to leave with something practical and relevant to use in their office.

In order to make it easier for all of our participants to satisfy their continuing education needs, attendance will be certified at every Congress lecture for all dental professionals.

Take a look on the following pages to see a sample of what is offered in the scientific program at the 82nd World Dental Congress this fall. Don't miss out on your opportunity to experience a world of knowledge in your field of interest. Send in your registrations today before the courses of your choice are filled! We look forward to welcoming you to Vancouver.

Robert J. Clarke, D.M.D.
Chairperson, Scientific Program
FDI 1994 Organizing Committee
c/o Canadian Dental Association
1815 Alta Vista Drive
Ottawa, Ontario K1G 3Y6

Tel.: 1-800-267-6354
Fax: (613) 523-3062



Glen McGivney (USA)

"Removable Partial Denture"

MONDAY, OCTOBER 3

— All-day participation course, presented in English —

This hands-on course will provide the participant with the skills necessary to fabricate a well-fitting, esthetic and functioning removable partial prosthesis.

The course will cover:

1. The common causes of failure of partial dentures,
2. Treatment planning,
3. A systematic approach to design, and
4. Simulated intra-oral tooth preparation, surveyor use and actual design.

About the clinician

Glen P. McGivney completed his undergraduate education at the University of Montana and his dental and prosthodontics specialty education were at Northwestern University in Chicago. His entire professional career has been devoted to promoting and improving the quality of prosthodontics services provided by the profession to the public.



Alan Boghosian (USA)

"Dental Materials for Dental Assistants"

TUESDAY, OCTOBER 4

— A.M. participation course, presented in English —

The continuous development and evolution of dental materials have greatly contributed to improvement in the restoration and preservation of natural tooth structure. Restorative modalities exist today that were not deemed possible a decade ago.

This lecture and participation course will discuss properties and allow for the hands-on mixing and manipulation of traditional and recently introduced dental materials. Participants will have the opportunity to handle several categories of dental materials including cements, impression materials and light cured restoratives. This course will emphasize techniques to maximize the physical properties of the material while allowing for modification of handling properties such as work and setting times.

About the clinician

Dr. Alan A. Boghosian is an Assistant Clinical Professor in the Division of Biological Materials at Northwestern University Dental School serving as Director of the Clinical Research Center. He maintains a private practice devoted primarily to restorative dentistry. Dr. Boghosian is an author of numerous publications and has lectured internationally on the subjects of dental materials and restorative procedures.



St. John Ambulance (Canada)

"Cardio-pulmonary Resuscitation"

TUESDAY, OCTOBER 4

— All-day participation course, presented in English —

Wednesday, October 5 (repeat)

Thursday, October 6 (repeat)

The C.P.R. Level 'C' course meets Canadian Heart Foundation standards. This five to six hour course is designed for Health Care Professionals. It offers one and two operator C.P.R. for the adult, as well as child and infant resuscitation and obstructed airway procedures for adult, child and infant. Certification is recommended to be renewed yearly.

About the clinician

St. John Ambulance is a national, voluntary agency founded in Canada over 100 years ago. Its mission is to enable Canadians to improve their health, safety and quality of life by providing training and community service.



Pat Robertson et al (Canada)

"Dental Radiography"

TUESDAY, OCTOBER 4

— A.M. participation course, presented in English —

Are your patients receiving the maximum diagnostic information for a minimum exposure to radiation? This program is designed for Certified Dental Assistants and Dental Hygienists with some experience in taking dental radiographs. Practical sessions with mannequins will involve small group demonstrations and discussion on bite-wing technique, endodontic radiography and troubleshooting difficult film placement.

About the clinician

Pat Robertson received her diploma in Dental Hygiene from the University of British Columbia in 1973 and her Instructors Diploma in 1984. She completed the University of North Carolina Special Session in Dental Radiology in 1987 and her Bachelor of Dental Science degree from the University of British Columbia in 1994. Pat has taught Dental Radiology to Certified Dental Assisting and Dental Hygiene students since 1981.

Hands-on Courses



Herbert Bader (USA)

**"Root Planing and Scaling:
Evolution or Revolution"**

FRIDAY, OCTOBER 7

— A.M. participation course, presented in English —

The most difficult and critical modality or therapy in dentistry is scaling and root planing. This hands-on course covers the in-depth use of ultrasonic instrumentation. The participant will be exposed to the theory and practice of ultrasonics and be given an opportunity to utilize the latest in piezo electric instrumentation on a typodont.

The attendee will receive a complete overview of the field with an excellent skill enhancement opportunity to become familiar with the most current and exciting techniques.

About the clinician

Dr. Herbert Bader is a lecturer in Periodontology at the Harvard School of Dental Medicine in Boston, MA. He has published a number of articles and abstracts in the field of periodontal diagnosis and is actively involved in clinical research. Dr. Bader is a full-time practicing periodontist and maintains a busy practice in Massachusetts.



Sherry Burns & Nancy Knispel (USA)

**"Isn't It About Time to Get on the Cutting Edge?
The Care, Maintenance and Sharpening of
Periodontal Instruments"**

WEDNESDAY, OCTOBER 5

— A.M. participation course, presented in English —

This new and innovative technique for learning instrument sharpening will have you on the cutting edge in no time. And sharp instruments mean higher productivity, longer instrument life and greater effectiveness.

This HALF DAY workshop includes lecture, demonstration and practice of instrument sharpening for sickle scalers and curettes. This new approach to instrument sharpening makes it easy to learn and to apply. A sharpening kit will be available for purchase.

About the clinicians

Ms. Burns is a Clinical Associate Professor of Dentistry, Department of Periodontics at the University of Missouri-Kansas City, and serves as an Educational Consultant to Hu-Friedy Manufacturing Company, Inc.

Nancy Knispel is the Supervisor of Sales Training at Hu-Friedy Manufacturing Company, Inc. She provides instrument training programs to dental professionals in the United States, Europe, and Latin America.



Howard Martin (USA)

**"Endodontics for the '90s —
Flare, File, Fill"**

WEDNESDAY, OCTOBER 5

— All-day participation course, presented in English —

This participation course will increase your clinical experience in technological advances to quickly improve your success and do more endodontics with ease, effectiveness and efficiency.

1. Utilizing ultrasonic biotechnological root canal preparation (Caviendo).
2. The warm lateral condensation technique (Endotec).
3. Control safe end K/H file and handle.

About the clinician

Howard Martin, D.M.D., Research Endodontist, V.A. Medical Center, Washington, D.C.; formerly Clinical Associate Professor, Georgetown University. Dr. Martin is the developer of the CAVIENDO, ENDOTEC, M SERIES ROOT CANAL INSTRUMENTS, and CONTROL SAFE END FILE/HEDSTROM & HANDLE.



Keith Rossein (USA)

**"Provisional Restorations:
Two User Friendly Restorative Techniques"**

WEDNESDAY, OCTOBER 5

— A.M. participation course, presented in English —

This is a hands-on workshop that will provide participants with two restorative techniques that can be immediately implemented in everyday practice. Using periodontal "splinting bars", participants will construct an "embedded bar bridge". This is a quick, permanent alternative to the traditional bridge, especially in today's economy.

In the second part, participants will construct high quality provisional bridges utilizing the Press Form Technique. This procedure will drastically reduce the amount of time needed to be scheduled for crown & bridge appointments and will minimize patient return-for-repair visits. All participants will leave with professional study models that are ideal for patient case presentation.

About the clinician

Dr. Keith Rossein has been in private practice for 23 years and is currently the Dental Director for Ellman International.



Sherry Burns & Nancy Knispel (USA)

**"How to Choose and How to Use the
Newest Curettes – Periodontal
Instrumentation Workshop"**

WEDNESDAY, OCTOBER 5

— P.M. participation course, presented in English —

This workshop will provide an opportunity for hands-on exercises using After Five, Mini Five, Langer and Rigid Series curettes. Practice will be accomplished using typodont models and extracted teeth. Strategies for developing instrument set-ups will also be presented.

About the clinicians

Ms. Burns is a Clinical Associate Professor of Dentistry, Department of Periodontics at the University of Missouri-Kansas City, and serves as an Educational Consultant to Hu-Friedy Manufacturing Company, Inc.

Nancy Knispel is the Supervisor of Sales Training at Hu-Friedy Manufacturing Company, Inc. She provides instrument training programs to dental professionals in the United States, Europe, and Latin America.



Ted DeVries (Canada)

"Computers - Up Close and Personal"

THURSDAY, OCTOBER 6

— All-day participation course, presented in English —

This session will give participants an opportunity to gain hands-on experience with various aspects of today's complete computer solutions. Demonstrations will cover basic components of the computer, the highly popular windows environment and a detailed look at a complete dental management system. The wide array of features that are incorporated in the dental software will be explained and left for you to experiment with.

About the clinician

In 1993, Ted DeVries joined Exan, one of the leading forces in dental practice management software. Here he consolidated his years of management and computer related experience with hands-on work in the health care industry. Developing high tech software and managing a successful business has given him a unique balance of high tech theory with practical applications.



Michael Goldfogel & Allen Kincheloe (USA)

"Esthetic Dentistry 1994"

THURSDAY, OCTOBER 6

— All-day participation course, presented in English —

This course is a full day course combining 1/2 day lecture with a 1/2 day hands on experience in a laboratory setting. The morning lecture serves as a didactic presentation showing step by step esthetic dentistry techniques. The participation reinforces the lecture material and allows the practitioner to use the most modern dental esthetic materials.

Topics to be included in this presentation are:

1. Most recent advances in esthetic materials,
2. Free hand veneering,
3. Diastema closure,
4. Porcelain veneers,
5. Masking discoloured teeth, and
6. Understanding of colour.

About the clinicians

Dr. Michael Goldfogel has worked extensively in the field of cosmetic and restorative resin systems. He has experience in both clinical application and research as well as consulting to a number of major dental manufactures. He has lectured to University and Professional audiences throughout the United States and Canada for the past 12 years.

Dr. Kincheloe graduated from the University of Texas Dental Branch of Houston in 1975. He has been involved in the evaluation of composite resin systems for over 15 years. Dr. Kincheloe has lectured throughout the United States, Canada and Europe on esthetic procedures.



Jeffrey Sherman (USA)

"Dental Electrosurgery for the 90's"

THURSDAY, OCTOBER 6

— A.M. participation course, presented in English —

Electrosurgical techniques are truly designed for the modern practice of dentistry. Electrosurgery, with its assortment of electrode tips, permits carving, sculpturing, or altering of soft tissue with little or no hemorrhage.

This course includes a complete discussion and demonstration of electrosurgical cutting, coagulation, and fulguration modes on the latest electrosurgical equipment. The participants will have the opportunity to practice the various types of procedures including frenectomy, operculectomy, crown preparation and biopsy under the supervision of the clinician.

About the clinician

Dr. Sherman has been closely involved with the research and development of electrosurgery in the dental profession. He is a highly respected lecturer at major dental meetings and schools, nationally and internationally.

Live Television Presentations



Stephen Lewis (USA) & Peter Stevenson-Moore (Canada)

**"Osseointegrated Implants for the Partially
Edentulous Patient"**

WEDNESDAY, OCTOBER 5

— A.M. presentation in English —

Simultaneous interpretation into French,
German and Spanish

Due to the overwhelming success of osseointegrated implants in edentulous patients it seemed only reasonable to apply osseointegration to the partially edentulous patient population as well. One major concern was that of esthetics, the ability to fabricate restorations which appear as natural teeth emerging through the mucosa. This live television presentation will demonstrate on a patient the implant components, techniques, and surgical/restorative interactions in order to achieve successful esthetic restorations for the partially edentulous patient.



Terry Donovan (USA) **"Porcelain Veneering Made Easy"**

WEDNESDAY, OCTOBER 5

— P.M. presentation in English —

Simultaneous interpretation into French,
German and Spanish

The popularity of porcelain veneers in the dental office is ever increasing due to patient awareness and demand. If success is to be achieved in creating porcelain veneers that truly reflect natural teeth, the dentist and the other members of the dental team must coordinate their efforts. This live television presentation will show all procedures leading to a successful preparation of porcelain veneers. All steps including treatment planning, tooth preparation, taking of impressions as well as cementation will be demonstrated live on a patient.

Live television presentations will constitute a vital part of the Congress. General practitioners will benefit from illustrations by skilled clinicians demonstrating new techniques and diverse procedures. Demonstrations will be shown live via giant screen TV. Participants will have an opportunity to ask questions to the clinician as he performs procedures on patients.



"Guided Tissue Regeneration"

THURSDAY, OCTOBER 6

— A.M. presentation in English —

Simultaneous interpretation into French,
German, Japanese and Spanish

Guided tissue regeneration offers the clinician a technique which has the potential to restore supporting tissues lost as a result of periodontal diseases. The technique relies on the use of physical barriers to exclude gingival epithelium and connective tissue from healing wound.

The demonstration will clearly show flap design, incisions, defect and root debridement and membrane placement. We will demonstrate adaptation and wound closure. Post-operative instructions and time for membrane removal will be discussed.



Werner Mormann (Switzerland) **"Computer-aided Direct Ceramic Restorations"**

THURSDAY, OCTOBER 6

— Noon presentation in English —

Simultaneous interpretation into French,
German, Japanese and Spanish

The clinician will perform a restorative procedure on a live patient using a chair-side computer-aided design and manufacturing technique for producing ceramic inlays, onlays and veneer laminates. Additional presentation, reservation on-site.



Herbert Bader (USA)

**"Hand and Powered Root Instrumentation:
The Heart and Soul of Periodontal Therapy"**

THURSDAY, OCTOBER 6

— P.M. presentation in English —

Simultaneous interpretation into French,
German, Japanese and Spanish

Successful management of the periodontal patient begins and ends with control of the root surface environment. This program addresses that issue with benchtop and live patient demonstration of the most current techniques and instruments to achieve a root surface compatible with biologic health. The attendee will become familiar with the new generation of hand instruments and ultrasonic systems, including a discussion and demonstration of the effects of antimicrobial lavage with ultrasonic scalers.



Clyde Schultz (USA)

"Recession Proof Your Practice: Strategies for Minimizing the Effects of Economic Downturn"

SUNDAY, OCTOBER 2

— All-day lecture, presented in English —

The objective of this program is to teach survival strategies for hard times. This includes advice on what to do and not to do in your office, with emphasis on positive techniques and effective strategies for dealing with patients, insurance problems, and communication with your staff.

About the clinician

Clyde L. Schultz, D.D.S. graduated in 1976 from the School of Dentistry, University of California at San Francisco. He has become one of dentistry's most respected authorities on chairside communication for professionals. He has lectured for universities and various private groups throughout the United States, Canada, and Europe.



Ronald Feinman (USA)

"Aesthetic Restorative Procedures, How, When and Why?"

SUNDAY, OCTOBER 2

— All-day lecture, presented in English —

This program will broaden the dentist's horizon in practicing dentistry as it explores a complete gamut of restorative dentistry today. Subjects include: porcelain veneers, bleaching teeth (office and home), direct and indirect composite systems, glass ionomers and cements, current retraction techniques, resin-bonded bridges and cosmetic tissue relationships. Eliminate the confusion by learning what, when, where and how to use.

About the clinician

Dr. Ronald A. Feinman has written numerous articles, lectured extensively, contributed to textbooks in esthetics and materials and is a consultant to dentistry. He maintains a general and cosmetic practice in Atlanta, Georgia.



Roy Page (USA)

"Periodontics for the 1990's and Beyond"

MONDAY, OCTOBER 3

— All-day lecture, presented in English —

The goal of this program is to summarize the major developments that have occurred in periodontics and periodontology over the past decade, and to project developments likely to occur in the immediate future. New approaches to treatment of the various kinds of periodontitis will be described and illustrated.

About the clinician

Professor of Periodontics, School of Dentistry, and Professor of Pathology, School of Medicine, Director of the Research Center in Oral Biology, and Director of the Regional Clinical Dental Research Center at the University of Washington Health Sciences Center.



Stanley Malamed (USA)

"Pain and Fear and the Future of Dentistry"

SUNDAY, OCTOBER 2

— All-day lecture, presented in English —

The management of pain and anxiety form the backbone of contemporary dental practice. The past decades have seen the introduction of a significant number of promising new techniques, drugs and equipment designed to aid the dental professional in a quest for a more pain-free and fear-free dental practice. In this program, the lecturer will discuss these advances, with an eye towards their possible applications in dentistry. Included will be a discussion of the relatively new technique of electronic dental anesthesia (EDA).

About the clinician

Dr. Malamed graduated from the New York University College of Dentistry in 1969. He then completed a dental internship and residency in anesthesiology at Montefiore Hospital and Medical Center. In 1973, Dr. Malamed joined the faculty of the University of Southern California School of Dentistry where today he is Professor and Chair of the Section of Anesthesia & Medicine.



Terry Donovan (USA)

"Aesthetic Restorative Dentistry and Materials Update"

MONDAY, OCTOBER 3

— All-day lecture, presented in English —

There is a host of options for the contemporary dentist in treating patients interested in esthetic dentistry. Many of these are less invasive than many of our conventional restorative therapies.

This presentation will delineate the procedures necessary for success with conventional and contemporary adhesive restorative dentistry. Many of the newer products will be evaluated and compared; emphasis will be on clinical product manipulation. Topics to be covered include: Effective gingival displacement; Impression materials: techniques for use; Solutions for fractured porcelain; bleaching, enamel microabrasion; bonded porcelain (veneers, crowns, inlays, onlays).

About the clinician

Dr. Terry Donovan received his D.D.S. from the University of Alberta in 1976. He has published extensively, and has lectured world wide on the topics of restorative dentistry and materials science. He is currently chairman of the American Dental Association's Council on Dental Materials, Instruments, and Equipment.

All-day Limited Attendance Courses allow the speaker to spend more time on antecedents, discuss different treatment procedures and thoroughly review specific cases. The participants benefit immensely from this sustained lecturing in a single field of dentistry. The number of participants will be restricted by room capacity.

Congress-at-a-glance



OCTOBER 2 SUNDAY	OCTOBER 3 MONDAY	OCTOBER 4 TUESDAY	OCTOBER 5 WEDNESDAY	OCTOBER 6 THURSDAY	OCTOBER 7 FRIDAY	OCTOBER 8 SATURDAY
PRE-CONVENTION COURSES (LIMITED ATTENDANCE)		LECTURES, LIVE TV PRESENTATIONS, HANDS-ON COURSES, POSTER PRESENTATIONS AND TABLE CLINICS FOR DENTISTS, ASSISTANTS, HYGIENISTS, TECHNICIANS AND OFFICE PERSONNEL				POST- CONVENTION
	OPENING CEREMONY	DENTAL TRADE EXHIBITION				
DINNER CRUISE	INTERNATIONAL EVENING	CHINESE EVENING	SALMON BARBECUE	FDI BALL		
	VISITS AND ONE DAY TOURS, ACCOMPANYING PERSONS' PROGRAM, CHILDREN'S PROGRAM					TOUR
PRE- CONGRESS TOURS	FDI BUSINESS MEETINGS FROM SEPTEMBER 29TH TO OCTOBER 8TH					POST- CONGRESS TOURS

Special Activities



GOLF DAY

Wednesday, October 5

Golfing enthusiasts — this is your day!

Take part in the FDI golf tournament which will be held at one of Vancouver's numerous, lush golf courses. It will be a shotgun start. **Register today for this event!** Due to space limitations, only 140 golfers will be registered on a first-come, first-served basis.

A golf shop will be available for rental of golf clubs and other standard equipment. The registration fee includes transportation to the golf course as well as a meal.



FUN RUN & WALK

Thursday, October 6

07:00 - 09:00

Join your fellow international runners in a 5 kilometer run or walk or a 10 kilometer run along the Sea Wall of Vancouver's famous Stanley Park, located near the downtown area.

Awards will be given to the winners of the competition but ... if you prefer to savour the scenic trails, you may run or walk at your own speed!

The registration fee includes transportation from the Convention Centre to Stanley Park, a limited edition T-shirt, a snack and a beverage.

3M Canada Inc.

◆ A ◆

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Zest Anchors Inc.
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North Shore Excursion

Thursday, October 6 • 08:30 - 16:00

A fully commentated motorcoach tour starts the day with a scenic drive over Lion's Gate Bridge and on to the Capilano Fish Hatcheries. Then it's on to the peak of Grouse Mountain by aerial gondola where the 3,700 foot vantage commands a panoramic view of Vancouver and the distant Gulf Islands. Continue on to the Capilano Suspension Bridge and nature park and then enjoy an authentic Potlatch barbecue lunch at one of the canyon's fine restaurants. Last, but not least, is a visit to the Lonsdale Quay, where kids board the Sea Bus for a 15 minute journey across the Burrard Inlet to downtown Vancouver.

**Science World/
Omnimax Theatre
Wednesday,
October 5
08:30 - 16:00**

A brief ride aboard the Sky-train monorail brings young participants to Science World on the shores of False Creek. This fun "hands on" museum has 7 unique galleries offering a staggering range of scientific activities and adventures: robots and computers, dinosaurs and glowing plasma balls. Youngsters will delve into an exciting new world of peculiar sights, sounds and sensations. Included is a visit to the spectacular Omnimax Theatre which boasts the world's largest domed screen. Participants will enjoy all the action of the current science and nature film being shown.

**All tours are
coordinated by FDI
and Y.M.C.A. staff
and include
transportation,
lunch and
refreshments.**

Vancouver Aquarium and Stanley Park

Tuesday, October 4 • 08:30 - 16:00

The adventure starts with an exploration by bus around the perimeter of world famous Stanley Park. Spanning 1,000 acres, Stanley Park is noted as one of North America's largest inner city parks, offering an entertaining array of attractions and amenities. A featured stop takes in the award-winning Vancouver Aquarium, located at the parks center. Children will have the opportunity to explore Canada's largest aquarium containing over 9,000 species of marine life from every corner of the world.

Afterwards, participants are treated to a fully escorted walking tour of Stanley Park which includes Beaver Lake, the Children's Farm Yard, Lost Lagoon and the Totem Poles at Brockton Point. A delightful opportunity for youngsters to enjoy fresh air and nature's wide open spaces right in the heart of the city.

Social Program

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OPENING CEREMONY

MONDAY, OCTOBER 3 * 17:15 - 19:30

The Opening Ceremony of the 82nd Annual World Dental Congress, sponsored by **Nobelpharma**, will take place at the Vancouver Trade and Convention Centre, which is in close proximity to all downtown hotels. Come and enjoy this two-hour extravaganza featuring the best talent Vancouver and Canada have to offer. After short welcoming speeches and a unique and exciting roll call of nations, the show will begin! Dancing and entertainment on the theme of cultural diversity will be the highlight of this program. This event promises to have something for everyone's taste!

All Congress participants are invited to attend the Opening Ceremony. Tickets are available on request to registered participants only - be sure to request your ticket when you register for the FDI Congress.

INTERNATIONAL EVENING

MONDAY, OCTOBER 3 * 19:30 - 22:30

Continue the celebration of the opening of the 82nd Annual World Dental Congress at the Pan Pacific Hotel where you will be immersed in an international atmosphere. Various international stations with food, song and dance will "transport" you around the world in just three hours! This is the perfect occasion to get to know your colleagues from other countries before the Congress begins.

FDI SCENIC EVENING DINNER CRUISE

SUNDAY, OCTOBER 2 * 19:00 - 22:00

An evening aboard one of Vancouver's many private yachts gives you a marvelous view of the city and its waterfront. Enjoy a sumptuous West Coast barbecue on board while you watch the scenery and sunset slip by. Live music tops off this relaxing and fun-filled event. In a city surrounded by water, a boat trip is the best possible way to capture West Coast charm and adventure.

DISCOVER THE ORIENT EVENING

TUESDAY, OCTOBER 4 * 19:00 - 23:00

Vancouver's largest ethnic community, and North America's second largest Chinatown, has fostered the establishment of Chinese cuisine that rivals Hong Kong and Taipei. Enjoy an evening of classical Chinese dance and music as accompaniment to an exquisite selection of foods served at traditional Chinese banquets. This evening, catered by one of the finest restaurants in the city, will be a highlight of the Congress.

SALMON BBQ / LOGGING SHOW

WEDNESDAY, OCTOBER 5 * 19:00 - 24:00

This unique evening will be a tribute to the legendary man of the wood, the logger. The evening begins with a full scale competitive Logger's Sports Show featuring actual lumberjacks demonstrating the art of axe-throwing, log rolling, pole climbing and many other daring skills. A sumptuous buffet dinner will be served, including the delectable B.C. salmon and a tempting array of hot and cold menu items that feature the finest and freshest in West Coast cuisine. A lively band will keep you dancing until the end of the evening. Casual dress is recommended.

FDI BALL

THURSDAY, OCTOBER 6 * 20:00 - 01:00

From the menu to the decor, the Black and White theme will be all around you. Be creative with your black and white wardrobe and blend with the decor! A prize will be awarded for the best costume. Music will range from classical to jazz and from swing to rock'n'roll, as a dinner without parallel is served. Black tie is optional.



FDI '94 Pre and Post Congress Tours

ALASKA (September 24 - October 1, 1994)



A memorable 7 night cruise to Alaska aboard Holland America's M.S. Westerdam. Heading up the inside passage, enjoy many delightful ports of Ketchikan (Alaska's first city), Juneau (Alaska's capital) and Glacier Bay (where the mighty glaciers will take your breath away!). A trip of a lifetime!

CANADIAN ROCKY MOUNTAINS (October 8 - 11, 1994)



See the wonders of the Canadian Rocky Mountains on this 4 day/3 night train and bus excursion. Travel through spectacular scenery during the day and enjoy comfortable hotel accommodations at night. You will see a wide variety of wildlife and natural attractions that Alberta and British Columbia have to offer; including the wonderful destinations of Jasper, Banff and Lake Louise.

HAWAII (October 7 - 14, 1994)



Enjoy a fabulous 8 day/7 night vacation in Hawaii on the island of Oahu. You can stay at the Hilton Hawaiian Village or at the Pacific Beach Hotel, both situated on the beautiful Waikiki beach. A perfect tour for those wishing to relax and enjoy the magnificent view of Hawaii.

LOS ANGELES (October 10 - 13, 1994)



Enjoy a marvelous 4 day/3 night cruise aboard Holland America's M.S. Westerdam from Vancouver to Los Angeles along the Canadian and U.S. coast. Since the cruise departs on October 10th, this is the perfect tour for those wishing to do some post-conference sightseeing in Vancouver.

AUSTRALIA AND NEW ZEALAND (October 7 - 21, 1994)



An incredible 15 day/14 night post-conference tour "down-under". In Australia, visit Cairns, the great Barrier Reef, the rain forests, Sydney, the Blue Mountains and go on a wine tour. In New Zealand, see the Coromandel Peninsula and Rotorua thermal springs. You will also have the opportunity to stay either on a sheep, kiwi fruit or cattle farm for two nights. Each farm will host 2 couples from our group – a sure way to enjoy local New Zealand hospitality. From here, optional stopovers for 4 days/3 nights in either Fiji or Hawaii.

For more detailed information,
contact the FDI 1994 Organizing Committee
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Continuity of Dental Treatment by Users of Alberta's Universal Dental Plan for the Elderly

D.W. Lewis, DDS, DDPH, M.Sc.D, FRCD(C)

G.W. Thompson, DDS, M.Sc.D, PhD, FRCD(C)

ABSTRACT

To evaluate the longitudinal utilization of Alberta's Extended Health Benefits dental plan for the elderly, its use over the preceding 13 years by patients over age 64, who had used the plan in 1991-92, was examined. Of these 96,596 patients, over half (56 per cent) were female and about two-thirds (68 per cent) received their dental care from a dentist only. However, for the older elderly and for those living outside Calgary and Edmonton, the percentage attending a denturist only or both a denturist and a dentist was greater.

Only individuals over age 77, or about 20 per cent of plan participants in 1991-92, were eligible to use the plan over the entire 14-year period examined in this study. However, the regularity of previous annual utilization of the plan was high. About 60 per cent of 70-74 year olds had used the plan for five or more years, while close to 50 per cent of the 80-84 year olds — who were eligible to use the plan for the entire period of the study — had done so in eight or more of the previous 14 years.

Despite varying plan eligibility according to patient age, the 96,596 patients who used the plan over the 14-year period made nearly 1.2-million patient visits, at which they received about 3.1-million dental services. The high continuity of annual usage demon-

strates that this group is not under-utilizing dental services.

Introduction

Alberta's Extended Health Benefits (EHB) dental plan for residents of the province over age 64, which started in 1973, has been described in previous papers.^{1,2} In one of these, the numbers and types of dental services provided under the plan were examined cross-sectionally each year from 1978-79 to 1991-92.² Although such cross-sectional analyses provide a good description of the year-to-year experience

of the EHB dental plan, they do not permit an assessment of the experience of one group of patients in the plan over time. To achieve this, one group of patients (cohort) must be identified, and their experience under the plan examined longitudinally. Thus, this paper analyzes the previous plan experience of all patients over 64 years of age who used the plan in 1991-92.

Methods

The general data processing and statistical methods used in the large EHB dental plan data base were previously described.² For this historical, longitudinal analysis, the

TABLE I

Percentage Of Users By Geographic Location and Provider For 1991-92 EHB Dental Plan Users Over Age 64

Region	Provider			N (%)
	Dentist	Denturist	Both	
Calgary	72	12	16	33,234 (34.4)
Edmonton	70	13	17	37,753 (39.1)
Northern Alberta	58	21	21	8,616 (8.9)
Central Alberta	60	19	19	5,539 (5.7)
Southern Alberta	63	20	16	9,715 (10.1)
Unclassified	70	15	15	1,739 (1.8)
Number	66,096 (68.4)	14,088 (14.6)	16,412 (17.0)	96,596 (100)

TABLE II

Percentage Of Users By Geographic Location and Age For 1991-92 EHB Dental Plan Users Over Age 64

Region	Age in Years in 1991-92				
	65-69	70-74	75-79	80-84	85+
Calgary	39	27	18	9	7
Edmonton	39	27	18	10	7
Northern Alberta	36	28	20	10	7
Central Alberta	37	28	18	10	6
Southern Alberta	35	28	20	11	6
Unclassified	42	27	16	10	6
Number	36,387 (38.1)	26,152 (27.1)	17,610 (18.2)	9,643 (10.0)	6,354 (6.6)

TABLE III

Regularity Of Use Over the Previous 13 Years By 1991-92 EHB Dental Plan Users Over Age 64

Years of Use Out of 14	Age in Years in 1991-92					Total >65 %
	65-69 %	70-74 %	75-79 %	80-84 %	85+ %	
1	36.2	7.6	4.9	5.8	7.1	17.8
2	25.5	10.1	6.9	7.6	10.2	15.2
3	17.0	11.0	7.8	9.0	11.0	12.5
4	11.7	11.4	8.0	8.5	9.9	10.5
5	7.3	12.3	7.9	7.7	10.0	9.0
6	2.3	14.4	7.5	6.5	8.2	7.3
7	—	13.1	7.4	6.3	6.6	6.0
8	—	9.3	7.4	6.7	6.4	5.0
9	—	6.4	7.7	5.8	4.9	4.0
10	—	3.4	8.0	5.9	4.7	3.3
11	—	1.0	8.4	6.0	5.3	2.7
12	—	—	8.0	7.0	4.9	2.5
13	—	—	6.0	7.2	5.1	2.1
14	—	—	4.3	9.9	5.7	2.1
Total % Number	100.0 (36,837)	100.0 (26,152)	100.2 (17,610)	99.9 (9,643)	100.0 (6,354)	100.0 (96,596)

unique identification numbers of each plan user in 1991-92 were identified. By purging all patient records without these numbers from the data file for each of the preceding 13 years, the appropriate data set for this longitudinal analysis of one user cohort was derived.

The demographic, geographic and dental utilization characteristics of all patients over 64 who used the plan in 1991-92 were determined, as was their historical utilization of the plan (services, procedures, and visits) in each of the preceding 13 years. Even though patients under 78 years of

age were probably not eligible for the plan for the entire 14-year period of the study (1978-79 to 1991-92), they were included since the previous use of the plan by the complete 1991-92 treatment group was analyzed.

Results

There were 96,596 patients over the age of 64 who used the plan at least once in 1991-92. Just over half of them were female (56.2 per cent) and, as shown in **Table I**, about two-thirds (68.4 per cent) had gone to dentists only during the 14-year period examined. In addition, as patient age increased, the proportion of female patients and the proportion attending both dentists and denturists increased, while the proportion attending a dentist only decreased. Relatively more patients from Edmonton and Calgary attended a dentist only under the plan in 1991-92, while relatively more patients from the other three regions of Alberta received treatment from denturists or both dentists and denturists (**Table I**).

In 1991-92, 62 per cent (100 - 38.1) of plan users were over age 69 (**Table II**). A slightly greater proportion of patients living in the province's two largest cities, Edmonton and Calgary, were in the youngest age group of 65-69 years.

The utilization of the plan in prior years by the 96,596 persons who used it in 1991-92 was examined. **Table III** shows the frequency of annual use of the plan (at least one visit to a dentist or denturist) by age group. Although they had only been eligible to use the plan for five to 10 years, 60 per cent of the patients aged 70-74 had done so for five or more years. For the group aged 80-84, who had been eligible throughout the period examined, nearly half (48.5 per cent) had used the plan in eight or more of the possible 14 years, and 24 per cent of them had used it for 12 or more years. Just over one-quarter (25.7 per cent) of the patients over age 84 who used the plan in 1991-92 had done so for 10 or more years.

The mean utilization of services, procedures and visits per patient

every four years, starting in 1978-79 and continuing through 1991-92, as well as total data over all 14 years are outlined in Table IV. While mean procedures and visits per user have been quite consistent over the 14-year period, the mean services per user increased and then declined after 1990-91.

Discussion

The past experience of the 96,596 patients over 64 years of age who used the Extended Health Benefits dental plan in 1991-92 was examined to evaluate the utilization of the plan. The annual, cross-sectional analyses of the plan have not allowed one particular group to be identified and evaluated.

Over half of the patients over 64 years of age and nearly two-thirds of the patients over 79 in 1991-92 were female. Although most patients in each age group used dentists only for their dental care, as patient age increased, relatively more persons used denturists and, in particular, both denturists and dentists.

The change in the preferred type of provider with age also occurs regionally. For example, about one in eight patients residing in Calgary and Edmonton went to a dentist only, but in the three less urban regions, one in five did. There were only small differences in the age distribution of patients among the five regions. Therefore, the observed differences in provider preference are unlikely to be a result of regional age differentials. A total of 17 per cent of plan users went to a dentist and denturist, and this was generally consistent regionally.

The decrease in mean services, procedures, and visits in 1991-92, relative to the immediately preceding years, are likely due to the May 1, 1991, decrease — from \$1,200 to \$960 — in the total amount of eligible dental care that could be received under the EHB dental plan over two consecutive years. These changes were necessary to curtail the total expenditures in the program.

Since only about 20 per cent of those using the plan in 1991-92 had been eligible for coverage for

TABLE IV

Mean Number Of Services, Procedures and Visits For 1991-92 EHB Dental Plan Users Over Age 64 From 1978-79 To 1991-92

Year	Services	Procedures	Visits	Number
1978-79	5.5	4.3	2.5	9,443
1982-83	5.5	4.5	2.5	18,154
1986-87	7.0	4.9	2.7	35,204
1990-91	7.3	4.9	2.6	56,750
1991-92	6.3	4.4	2.3	96,596
Total (Over 14 Years)	32.3	22.9	12.4	96,596

the full 14 years, the mean totals over the 14 years are understandably lower. Even so, the 96,596 patients have received a total of just over 3.1 million services and nearly 1.2 million visits under the plan.

The most striking finding with this group of patients was their regularity of previous participation in the plan. It should be noted that 45 per cent of all persons eligible for the plan are estimated to have used it in 1991-92. Nearly half of the patients aged 80-84 in 1991-92 had attended for dental care in eight or more of the possible 14 years, and nearly one-quarter of them had attended for 12 or more years. Similarly, just over one-quarter of those over 84 years old had attended for at least 10 of the possible 14 years.

The high continuity of annual use is consistent with the findings of others³ that the stereotypic categorization of older persons as under-utilizers of dental care is incorrect. Once access to dental care had been achieved and, as in this case, dental care costs were subsidized, the continuity of utilization was very good. ■

Acknowledgment: This research is supported by NHRDP Grant 6609-1503CD, from the Department of National Health and Welfare, Ottawa, Canada. The data base was made available by the Division of Health Economics and Statistics, Alberta Health. The programming and data analyses were done by Mr. Andrew Folkins, fac-

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3. Meskin, L.M., Dillenberg, J., Heft, M. et al. Economic impact of dental service utilization by older adults. *JADA* 120:665-68, 1990.

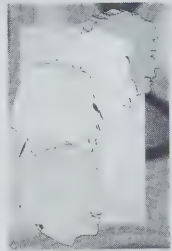


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Prevention Of Root Caries In Older Adults

Douglas Galan, DMD, M.Sc.

Edward Lynch, BA, BDS, FDS

Introduction

Older adults are retaining more teeth because of improved oral hygiene, the prevention and treatment of oral diseases, and a greater utilization of dental services. Over time, root surfaces may become exposed to the oral environment, increasing the susceptibility to decay. Root caries may develop quickly if there is a small deterioration in oral hygiene, slight dietary changes, or the use of drugs that reduce salivary flow. For healthy, ambulatory adults, root caries has a prevalence rate of 20-50 per cent,¹⁻¹⁰ but this increases dramatically among institutionalized, chronically-ill individuals and the elderly (up to 90 per cent prevalence).^{6,11-17} Although prevalence values vary widely, they generally increase with age,^{3,4,6-8,11,13,18-22} from about one in nine root surfaces at risk for individuals under 30 years of age to approximately two in three for those over 60.

Despite a greater prevalence rate with increasing age, not all exposed root surfaces develop caries. This suggests that preventive dental therapies are effective in reducing root caries initiation, even among those individuals most at risk. This paper will focus upon some of the methods used for the prevention and control of root caries.

Prevention Strategies

Prevention strategies rely principally on the clinician's judgement

as to whether an exposed root surface displays signs indicating the presence of an active carious process. Presumably, these signs infer the presence of cariogenic microorganisms within the root tissue, which will bring about its destruction when supplied with acceptable cariogenic substrates. The basis of a prevention program would logically include:

1. Elimination of cariogenic substrates by dietary and oral hygiene measures;
2. Elimination of any cariogenic organisms by applying chemotherapeutic agents;
3. Attempts to recalcify the partially decalcified dentin matrix through the topical application of suitable agents, hopefully to increase resistance to further decalcification;
4. Elimination of any dentin exhibiting the signs of an active carious process;
5. Protection of selected sound root dentin considered to be at particular risk by using restorative materials.

Prevention of root caries can be divided into three phases:

1. Primary prevention — the practices and procedures carried out before any overt signs or symptoms of the disease are apparent;
2. Secondary prevention — the early detection of disease and any consequent action which may arrest or reverse the disease process; and

3. Tertiary prevention — the management of established disease to limit further development of the condition.²³

Primary Prevention

1. Oral Hygiene

The mechanical removal of plaque from tooth surfaces has been a major platform in primary prevention strategies for both dental caries and periodontal disease. Unfortunately, clinical practice and group studies indicate that the technical skill, time, effort and perseverance required to continually maintain oral cleanliness exceeds the ability of the average patient,²⁴ and as they get older, most will experience some loss of periodontal attachment and be at risk of developing root caries.²⁵ Surface contours, even on the vestibular surfaces of teeth and gingiva, make toothbrush access to root surfaces difficult. To remove plaque from the proximal surfaces of roots by means of a conventional toothbrush is an impossibility. While dental floss or dental tape may be an effective solution for cleaning the generally convex surfaces of the crowns of teeth, root surfaces pose quite different problems. Virtually all root surfaces, with the possible exception of maxillary central incisors, are concave in the vestibulo-lingual direction. Floss will only span such concavities, and fail to remove plaque from the surface. While small interproximal brushes, when used with considerable dexterity, are likely to access such surfaces and prove effective,

dentists have considerable difficulty in teaching and motivating patients on how to apply these brushes to every root surface. Further, reductions in oral hygiene ability can occur due to motor skill deficiencies associated with various medical conditions such as Parkinson's disease, or a lack of manual dexterity associated with arthritis. In addition, oral anatomic factors such as malocclusion, drifting, tipping and supraversion permit plaque accumulation, because it is difficult to provide adequate oral hygiene to these areas.²⁶ The most effective prevention method is to avoid exposed root surfaces and perform conservative gingival surgery whenever possible.²⁷⁻³⁰ However, with regular, frequent dental visits, and the use of professional tooth cleaning combined with fluoride treatments, root lesions can be suppressed.^{31,32}

2. Systemic Fluoride

Increased fluoride levels in dental hard tissues decrease acid solubility³³ and reduce the acid production of plaque organisms.³⁴ Cementum concentrates fluoride to a greater degree than other calcified tissue³⁵⁻³⁹ and attains more fluoride than normal after the exposure of root surfaces to the oral environment.⁴⁰⁻⁴⁴ Although fluoride concentration continues to increase with age,⁴⁵ it is unevenly distributed, with the highest concentrations found in the surface cementum.^{35-37,39,46,47} Because of this, epidemiological studies reveal that:

1. Persons living in areas with a fluoridated water supply have higher fluoride concentrations in cementum than those from non-fluoridated areas;^{5,35,39,41,42,48,49}
2. The fluoride concentration increases with the length of exposure time to fluoridated drinking water;^{43,49} and
3. The root caries prevalence is much lower (up to 50 per cent) in fluoridated versus non-fluoridated communities.^{2,5,48,50,51}

Beck et al⁵² also showed that the length of exposure time supports the position that the systemic effects of fluoridation, rather than

topical effects, are more crucial for root caries prevention. All this data clearly refutes the often cited argument of anti-fluoridationists, that water fluoridation does not benefit adults.

3. Chewing Gum

Chewing gum after meals could further serve as a primary preventive measure. Chewing of both sugar-containing and sugar-free gums for 20 minutes can lead to an elevation of plaque pH, when it has been depressed following consumption of fermentable carbohydrate.⁵³⁻⁵⁶ The increase in salivary pH on chewing stimulation is due to the increase in bicarbonate concentration, which is proportional to flow rate.⁵⁷ Associated increases in pH due to increased bicarbonate content were likely more than adequate to offset any pH-lowering potential due to plaque acid formation.⁵⁸ With sugar-containing gums, the salivary sucrose concentration peaks within the first one to two minutes of chewing and falls rapidly, suggesting a rapid sucrose clearance⁵⁸ corresponding to the peak in salivary flow rate that occurs in the first minute of chewing.⁵⁸

Secondary Prevention

With secondary prevention, it is important to bear in mind that an entire population is not at risk of getting root caries at any particular time. While primary prevention is targeted for large numbers of people, some of whom may not be at risk at all, secondary prevention must involve some form of risk assessment and the specific assignment of preventive measures. Attempts at early detection and prediction of individuals at risk of root caries attack, to facilitate the provision of secondary preventive measures, has been shown to be extremely difficult.⁵² A discussion of the various risk indicators/factors and the clinical assessment of root caries is beyond the scope of this paper, but is fully discussed elsewhere.⁶⁰

1. Topical Fluoride

The topical fluorides contained in dentifrices, rinses, gels and var-

nishes are one of the most effective means of treating initial root caries lesions, even at the subclinical level.^{3,25,61,62} It has been documented that after topical fluoride use and oral hygiene instruction,^{63,64} remineralization of root caries occurs because root surfaces concentrate fluoride^{44,64-69} and are more resistant to decalcification.^{44,65}

Fluoridated dentifrices have been shown to facilitate remineralization of root caries lesions, which occurs after tooth brushing.⁷⁰⁻⁷⁵ Clinical trials using a fluoridated dentifrice on adults up to age 78 produced a 33 per cent reduction in caries incidence after one year in one study,⁷⁶ while a 67 per cent reduction in root caries incidence over one year in individuals aged 54-plus years has also been demonstrated.⁷⁰ Billings et al⁷⁷ demonstrated that 70 per cent of the root caries lesions were arrested after 24 months, with definitive remineralization occurring over a 12-18 month period following the application of a one-per-cent sodium fluoride gel. An amine fluoride/stannous fluoride combination has been shown to reduce the root caries scores up to 47 per cent, and to decrease the number of softened surfaces, compared to the 10 per cent reduction, and lack of affect on the softened surfaces, seen with sodium fluoride.⁷⁸ Overall, no matter what type of fluoride gel is used, shallow root caries lesions will demonstrate a decrease in severity in the presence of frequent fluoride applications, although the lesions may not completely remineralize in every case. High fluoride uptake can occur following treatment of the root surfaces with a fluoride varnish,^{79,80} because varnishes impart more fluoride into cementum than other topical fluoride agents.⁸¹ Varnishes are also very effective in remineralizing root caries lesions, because they adhere to tooth surfaces for relatively long periods (weeks or months) and are ideal vehicles for long-term agent release.⁸²

Conflicting results have been presented in the literature on the effectiveness of sodium fluoride rinses in the prevention of root car-

TORADOL®

10 mg tablets & 30 mg/mL IM injections KETOROLAC TROMETHAMINE

Effectively treating acute pain

TORADOL® (ketorolac tromethamine) 10 mg tablets

TORADOL® IM (ketorolac tromethamine injection) 10 mg/mL, 15 mg/mL or 30 mg/mL intramuscular injection

THERAPEUTIC CLASSIFICATION: Analgesic Agent

ACTION:

Toradol (ketorolac tromethamine) is a non-steroidal anti-inflammatory drug (NSAID) that exhibits analgesic activity mediated by peripheral effects. Ketorolac inhibits the synthesis of prostaglandins through inhibition of the cyclo-oxygenase enzyme system. At analgesic doses, it has minimal anti-inflammatory and antipyretic activity. Pain relief is comparable following the administration of ketorolac by intramuscular or oral routes. The peak analgesic effect occurs at 2-3 hours post-dosing with no evidence of a statistically significant difference over the recommended dosage range. The greatest difference between large and small doses of Toradol administered by either route is in the duration of analgesia. Ketorolac tromethamine is rapidly and completely absorbed when administered by either the oral or the intramuscular route. The pharmacokinetics are linear following single and multiple dosing. Steady state plasma levels are attained after one day of Q.I.D. dosing. Following oral administration, peak plasma concentrations of 0.7 to 1.1 µg/mL occurred at an average of 44 minutes after a single 10 mg dose. The terminal plasma elimination half-life ranged between 2.4 and 9.0 hours in healthy adults, while in elderly subjects (mean age = 72 years), it ranged between 4.3 and 7.6 hours. A high fat meal decreased the rate, but not the extent, of absorption of oral ketorolac tromethamine.

The use of an antacid had no effect on the pharmacokinetics of ketorolac. Following intramuscular administration, peak plasma concentrations of 2.2 to 3.0 µg/mL occurred an average of 50 minutes after a single 30 mg dose. The terminal plasma half-life ranged between 3.5 and 9.2 hours in young adults and between 4.7 and 8.6 hours in elderly subjects (mean age = 72 years). In renally impaired patients there is a reduction in clearance and an increase in the terminal half-life of ketorolac tromethamine (see table below). The primary route of excretion of ketorolac tromethamine and its metabolites (conjugates and the p-hydroxy metabolite) is in the urine (91.4%) with the remainder (6.1%) being excreted in the feces. More than 99% of the ketorolac in plasma is protein bound over a wide concentration range. The hemodynamics of anaesthetized patients were not altered by parenteral administration of Toradol.

THE INFLUENCE OF AGE, LIVER AND KIDNEY FUNCTION ON THE CLEARANCE AND TERMINAL HALF-LIFE OF TORADOL IM¹ AND ORAL²

TYPES OF SUBJECTS	TOTAL CLEARANCE (in L/h/kg) ³		TERMINAL HALF-LIFE (in hours)	
	IM MEAN (range)	ORAL MEAN (range)	IM MEAN (range)	ORAL MEAN (range)
Normal Subjects IM (n=54) Oral (n=77)	0.023 (0.010-0.046)	0.025 (0.013-0.050)	5.3 (3.5-9.2)	5.3 (2.4-9.0)
Healthy Elderly Subjects IM (n=13), Oral (n=12) (mean age = 72, range = 65-78)	0.019 (0.013-0.034)	0.024 (0.018-0.034)	7.0 (4.7-8.6)	6.1 (4.3-7.6)
Patients with Hepatic Dysfunction IM and Oral (n=7)	0.029 (0.013-0.066)	0.033 (0.019-0.051)	5.4 (2.2-6.9)	4.5 (1.6-7.6)
Patients with Renal Impairment IM and Oral (n=9) (serum creatinine 1.9-5.0 mg/dL)	0.014 (0.007-0.043)	0.016 (0.007-0.052)	10.3 (8.1-15.7)	10.8 (3.4-18.9)
Renal Dialysis Patients IM (n=9)	0.016 (0.003-0.036)		13.6 (8.0-39.1)	

¹ Estimated from 30 mg single IM doses of ketorolac tromethamine

² Estimated from 10 mg single oral doses of ketorolac tromethamine

³ Litres/hour/kilogram

INDICATIONS:

Oral Route: Orally administered Toradol (ketorolac tromethamine) is indicated for the short-term management of mild to moderately severe pain, including post-surgical pain (such as general, orthopaedic and dental surgery), acute musculoskeletal trauma pain and post-partum uterine cramping pain.

Intramuscular Route: Intramuscular injection of Toradol is indicated for the short-term management of moderate to severe pain, including pain following major abdominal, orthopaedic and gynecological operative procedures.

CONTRAINDICATIONS:

Hypersensitivity: Like other non-steroidal anti-inflammatory drugs, Toradol (ketorolac tromethamine) has been associated with hypersensitivity reactions. Toradol should not be used when there is a known or suspected hypersensitivity to the drug. Because of the possibility of cross-sensitivity, Toradol should not be used in patients with the complete or partial syndrome of nasal polyps, angioedema, bronchospastic reactivity (e.g. asthma) or other allergic manifestations to acetylsalicylic acid (ASA) or other non-steroidal anti-inflammatory drugs. Severe and fatal anaphylactoid reactions have occurred in such individuals.

Gastrointestinal: As with other NSAIDs, Toradol also should not be used in patients with peptic ulcer or active inflammatory disease of the gastrointestinal system. Severe and fatal reactions have occurred in such individuals.

WARNINGS:

The long-term administration of Toradol (ketorolac tromethamine) is not recommended. The most serious risks associated with NSAIDs including Toradol are:

Gastrointestinal Ulcerations, Bleeding and Perforation: Serious gastrointestinal toxicity, such as bleeding, ulceration, and perforation, can occur at any time, with or without warning symptoms, during therapy with non-steroidal anti-inflammatory drugs. To date, studies with NSAIDs have not identified any subset of patients not at risk for developing peptic ulceration and bleeding. Post-marketing experience with Toradol suggests that there may be a greater risk of gastrointestinal ulcerations, bleeding, and perforation in the elderly, and most spontaneous reports of fatal gastrointestinal events are in the aged population.

LONG-TERM USE OF TORADOL: The oral use of Toradol 10 mg QID on a long-term basis is associated with more gastrointestinal tract adverse effects than is ASA 650 mg QID.

In a clinical trial in 823 patients with chronic pain states comparing Toradol tablets 10 mg QID (553 patients) with ASA 650 mg QID (270 patients), during the first week there was a 2.4% dropout rate because of upper GI complaints in the Toradol tablets treated patients compared with 0.4% rate in the ASA treated group. After the first 2 weeks, the dropout rates due to GI pain or discomfort were comparable in both treatment groups. The time-adjusted percentages, which are not statistically significantly different, of patients who developed ulcer or upper GI bleeding are as follows:

	CUMULATIVE OCCURRENCE KETOROLAC	ASA
INTERVAL		
≤ 3 months	0.69*	0*
≤ 6 months	1.59*	0.73*

*There was no statistically significant difference between ketorolac and ASA at either of the intervals tested.

PHYSICIANS SHOULD CAREFULLY WEIGH THE POTENTIAL RISKS AND BENEFITS OF USING TORADOL TABLETS ON A LONG-TERM BASIS. PATIENTS SHOULD BE INSTRUCTED TO WATCH FOR SIGNS OF SERIOUS GI ADVERSE EVENTS AND THEY SHOULD BE MONITORED MORE CLOSELY THAN IF THEY WERE ON ANOTHER NSAID.

Renal Toxicity: The following renal abnormalities have been associated with Toradol and other drugs that inhibit renal prostaglandin biosynthesis: acute renal failure, nephrotic syndrome, interstitial nephritis, renal papillary necrosis.

Haemorrhage: Postoperative haematomas and other symptoms of wound bleeding have been reported in association with the perioperative use of intramuscular Toradol. If Toradol is to be administered to patients who have coagulation disorders or who are receiving drug therapy that interferes with haemostasis, careful observation is advised.

Hypersensitivity Reactions: The possibility of severe or fatal hypersensitivity reactions should be considered, even for patients with no known history of previous exposure or hypersensitivity to Toradol or other NSAIDs. As with other NSAIDs, patients should be questioned for history of allergy to NSAIDs or ASA or for the syndrome consisting of nasal polyps, ASA allergy and asthma before being prescribed Toradol. Asthmatic patients with triad asthma (the syndrome of nasal polyps, asthma and hypersensitivity to ASA or other NSAIDs) may be at particular risk for severe hypersensitivity reactions.

Other NSAIDs: Ketorolac tromethamine is not recommended for concurrent use with other NSAIDs because of the potential for additive side effects.

Use in Pregnancy and Lactation: The administration of ketorolac tromethamine is not recommended during pregnancy or lactation. After 1 day at 10 mg QID, oral dosing, Toradol has been detected in the milk of lactating women at a maximum concentration of 7.9 ng/mL.

Use in Labour: Ketorolac tromethamine is not recommended for use as an obstetric preoperative medication or for obstetrical analgesia because of the known effects of NSAIDs on uterine contraction and fetal circulation.

Use in Children: Safety and efficacy in children have not been established. Therefore, Toradol is not recommended for use in children under age 16.

Use in the Elderly: Because ketorolac is cleared somewhat more slowly by the elderly (See PHARMACOKINETICS) who are also more sensitive to the gastrointestinal and renal effects of NSAIDs (See WARNINGS and PRECAUTIONS), extra caution and the lowest effective dose (See DOSAGE AND ADMINISTRATION) should be used.

PRECAUTIONS:

Physicians should be alert to the pharmacologic similarity of Toradol (ketorolac tromethamine) to other non-steroidal anti-inflammatory drugs that inhibit cyclo-oxygenase. Toradol is not an anesthetic agent and possesses no sedative or anxiolytic properties.

Gastrointestinal Effects: Close medical supervision is recommended in patients prone to gastrointestinal tract irritation, particularly those with a history of peptic ulcer, diverticulosis or other inflammatory disease of the gastrointestinal tract. In these cases, the physician must weigh the benefits of treatment against the possible hazards. Patients taking an NSAID including ketorolac tromethamine should be instructed to contact a physician immediately if they experience symptoms or signs suggestive of peptic ulceration or gastrointestinal bleeding. These reactions can occur at any time during the treatment. If peptic ulceration is suspected or confirmed, or if gastrointestinal bleeding occurs, ketorolac tromethamine should be discontinued and appropriate treatment instituted with close patient monitoring.

Renal Effects: As with other drugs that inhibit prostaglandin biosynthesis, elevation of blood urea nitrogen (BUN) and creatinine have been reported in clinical trials with (ketorolac tromethamine). Since ketorolac tromethamine and its metabolites are excreted primarily by the kidney, the following precautions are indicated for patients with: **Severely impaired renal function** (serum creatinine values greater than 5 mg/dL, 442 µmol/L): Toradol is not recommended; **Moderately impaired renal function** (serum creatinine values ranging from 1.9-5.0 mg/dL, 168 to 442 µmol/L) - The total daily dose of ketorolac tromethamine should be reduced by half. In these patients the rate of ketorolac tromethamine clearance was reduced to approximately half of normal. Patients who are volume depleted may be dependent on renal prostaglandin production to maintain renal perfusion and, therefore, glomerular filtration rate. In such patients, the use of drugs which inhibit prostaglandin synthesis has been associated with further decreases in renal blood flow. Predisposing factors include sepsis, impaired renal function, heart failure, liver dysfunction, diuretic therapy, and advanced age. Caution is advised if ketorolac tromethamine is used in such circumstances. Close monitoring of urine output, serum urea and serum creatinine is recommended until renal function recovers.

Hepatic Effects: Meaningful elevations (greater than 3 times normal) of serum transaminases (glutamate pyruvate (SGPT or ALT) and glutamic oxalacetic (SGOT or AST)), occurred, controlled clinical trials in less than 1% of patients. If clinical signs and symptoms consistent with liver disease develop, or if systemic manifestations occur (e.g., eosinophilia, rash, etc.), ketorolac tromethamine should be discontinued. Patients with impaired hepatic function from cirrhosis do not have any clinically important changes in ketorolac tromethamine clearance. Studies in patients with active hepatitis or cholestasis have not been performed.

Fluid and Electrolyte Balance: Fluid retention and edema have been observed in patients treated with Toradol. Therefore, as with many other NSAIDs, the possibility of precipitating congestive heart failure in elderly patients or those with compromised cardiac function should be considered. Toradol should be used with caution in patients with cardiac decompensation, hypertension or other conditions which cause a predisposition to fluid retention.

Hematologic Effects: Ketorolac tromethamine inhibits platelet function and may prolong bleeding time. It does not affect platelet count, prothrombin time (PT) or partial thromboplastin time (PTT). Unlike the prolonged effects from ASA the inhibition of platelet function by ketorolac tromethamine is normalized within 24 to 48 hours after the drug is discontinued. Patients on full anti-coagulation therapy (e.g. heparin or dicumaryl derivatives) may be at increased risk of bleeding if given Toradol concurrently. Thus, the benefit should be weighed against this risk. The concomitant use of Toradol and heparin (5000 U.S.C. BID) appears to be associated with less risk (see DRUG INTERACTIONS). In patients receiving anticoagulants, the use of intramuscular haematoma formation from Toradol IM injections may be increased. In post-marketing experience, postoperative wound haemorrhage has been reported with the use of Toradol. Therefore, caution should be exercised when strict haemostasis is critical. Toradol IM

not recommended as a pre-operative or intra-operative medication because of the risk of excessive bleeding. Blood dyscrasias associated with the use of NSAIDs are rare, but could occur with severe consequences.

Infection: In common with other non-steroidal anti-inflammatory drugs, ketorolac tromethamine may mask the usual signs of infection.

DRUG INTERACTIONS:

Protein Binding: Toradol (ketorolac tromethamine) is highly bound to human plasma protein (mean 99.2%) and binding is independent of concentration. As ketorolac tromethamine is a highly potent drug and present in low concentrations in plasma, it would not be expected to displace other protein-bound drugs significantly. Therapeutic concentrations of digoxin, warfarin, acetaminophen, phenytoin, and tolbutamide did not alter ketorolac tromethamine protein binding.

Anticoagulant Therapy: Prothrombin time should be carefully monitored in all patients receiving oral anticoagulant therapy concomitantly with ketorolac tromethamine. Toradol IM given with two doses of 5000 U of heparin to 11 healthy volunteers resulted in a mean template bleeding time of 6.4 min (3.2-11.4 min) compared to a mean of 6.0 min (3.4-7.5 min) for heparin alone and 5.1 min (3.5-8.5 min) for placebo. The *in vitro* binding of warfarin to plasma proteins is only slightly reduced by ketorolac tromethamine (99.5% control vs. 99.3%) at plasma concentrations of 5 to 10 µg/mL.

Digoxin: Ketorolac tromethamine does not alter digoxin protein binding.

Salicylates: *In vitro* studies indicated that, at therapeutic concentrations of salicylates (300 µg/mL), the binding of ketorolac tromethamine was reduced from approximately 99.2% to 97.5% representing a potential two-fold increase in unbound Toradol plasma levels.

Enzyme Induction: There is no evidence, in animal or human studies, that ketorolac tromethamine induces or inhibits the hepatic enzymes capable of metabolizing itself or other drugs. Hence, it would not be expected to alter the pharmacokinetics of other drugs due to enzyme induction or inhibition mechanisms.

Probenecid: Concomitant administration of ketorolac tromethamine and probenecid results in the decreased clearance of ketorolac and a significant increase in ketorolac plasma levels (approximately three-fold increase) and terminal half-life (approximately two-fold increase).

Furosemide: Ketorolac tromethamine reduces the diuretic response to furosemide by approximately 20% in normovolemic subjects.

Lithium: Some NSAIDs have been reported to inhibit renal lithium clearance, leading to an increase in plasma lithium concentrations and potential lithium toxicity. The effect of ketorolac tromethamine on lithium plasma levels has not been studied.

Methotrexate: The concomitant administration of methotrexate and some NSAIDs has been reported to reduce the clearance of methotrexate, thus enhancing its toxicity. The effect of ketorolac tromethamine on methotrexate clearance has not been studied.

Morphine: Intramuscular Toradol has been administered concurrently with morphine in several clinical trials of postoperative pain without evidence of adverse interactions.

ADVERSE EVENTS:

TORADOL TABLETS: Short-Term Patient Studies - The incidence of adverse reactions in 371 patients receiving multiple 10 mg doses of Toradol (ketorolac tromethamine) for pain resulting from surgery or dental extraction during the post-operative period (less than 2 weeks) is listed below. These reactions may or may not be drug related. **Incidence between 4 and 9%:** **Nervous system** - somnolence, insomnia; **Digestive system** - nausea. **Incidence between 2 and 3%:** **Nervous system** - nervousness, headache, dizziness; **Digestive system** - diarrhea, dyspepsia, gastrointestinal pain, constipation. **Body as a whole** - fever. **Incidence 1% or Less:** **Nervous system** - abnormal dreams, anxiety, dry mouth, hyperkinesia, paresthesia, increased sweating, euphoria, hallucinations; **Digestive system** - anorexia, flatulence, vomiting, stomatitis, gastritis, gastrointestinal disorder, sore throat; **Body as a whole** - asthenia, pain, back pain; **Cardiovascular system:** vasodilatation, palpitation, migraine, hypertension; **Respiratory system** - cough increased, rhinitis, dry nose; **Musculo-skeletal system** - myalgia, arthralgia; **Skin and appendages** - rash, urticaria; **Special senses** - blurred vision, ear pain; **Urogenital system:** dysuria.

Long-Term Patient Study - The adverse reactions listed below were reported to be probably related to study drug in 553 patients receiving long-term oral therapy (approximately 1 year) with Toradol. **Incidence between 10 and 12%:** **Digestive system** - dyspepsia, gastrointestinal pain.

Incidence Between 4 and 9%: **Digestive system** - nausea, constipation; **Nervous system** - headache. **Incidence Between 2 and 3%:** **Digestive system** - diarrhea, flatulence, gastrointestinal fullness, peptic ulcers; **Nervous system** - Dizziness, somnolence; **Metabolic/Nutritional disorder** - edema. **Incidence 1% or Less:** **Digestive system** - eructation, stomatitis, vomiting, anorexia, duodenal ulcer, gastritis, gastrointestinal haemorrhage, increased appetite, melena, mouth ulceration, rectal bleeding, sore mouth; **Nervous system** - abnormal dreams, anxiety, depression, dry mouth, insomnia, nervousness, paresthesia; **Special senses** - tinnitus, taste perversion, abnormal vision, blurred vision, deafness, lacrimation disorder; **Metabolic/Nutritional disorder** - Weight gain, alkaline phosphatase increase, BUN increased, excessive thirst, generalized edema, hyperuricemia; **Skin and appendages** - pruritus, rash, burning sensation skin; **Body as a whole** - asthenia, pain, back pain, face edema, hernia; **Musculo-skeletal system** - arthralgia, myalgia, joint disorder; **Cardiovascular system:** chest pain, chest pain substernal, migraine; **Respiratory system** - dyspnea, asthma, epistaxis; **Urogenital system** - hematuria, increased urinary frequency, oliguria, polyuria; **Hemic and lymphatic** - Anemia, purpura.

TORADOL IM: The adverse reactions listed below were reported in Toradol IM clinical efficacy trials. In these trials patients (n=660) received either single 30 mg doses (n=151) or multiple 30 mg doses (n=509) over a time period of 5 days or less for pain resulting from surgery.

These reactions may or may not be drug related. **Incidence Between 10 and 13%:** **Nervous system** - somnolence; **Digestive system** - Nausea. **Incidence Between 4 and 9%:** **Nervous system** - headache; **Digestive system** - vomiting; **Injection site** - injection site pain. **Incidence Between 2 and 3%:** **Nervous System** - sweating, dizziness; **Cardiovascular system** - vasodilatation. **Incidence 1% or Less:** **Nervous system** - insomnia, increased dry mouth, abnormal dreams, anxiety, depression, paresthesia, nervousness, paranoid reaction, speech disorder, euphoria, libido increased, excessive thirst, inability to concentrate, stimulation; **Digestive system** - flatulence, anorexia, constipation, diarrhea, dyspepsia, gastrointestinal fullness, gastrointestinal haemorrhage, gastrointestinal pain, melena, sore throat, liver function abnormalities, rectal bleeding, stomatitis; **Cardiovascular system** - hypertension, chest pain, tachycardia, haemorrhage, palpitation, pulmonary embolus, syncope, ventricular tachycardia, pallor, flushing; **Injection site** - injection site reaction; **Body as a whole** - asthenia, fever, back pain, chills, pain, neck pain; **Special senses** - taste perversion, tinnitus, blurred vision, diplopia, retinal haemorrhage; **Musculo-skeletal system** - myalgia, twitching; **Respiratory system** - asthma, cough increased, dyspnea, epistaxis, hiccup, rhinitis; **Skin and appendages** - pruritus, rash, subcutaneous hematoma, skin disorder; **Urogenital system** - dysuria, urinary retention, oliguria, increased urinary frequency, vaginitis; **Metabolic/nutritional disorders** - edema, hypokalemia, hypovolemia **Hemic and lymphatic system** - anemia, coagulation disorder, purpura.

Post-Marketing Experience: The following post-marketing adverse experiences, although rare (1% or less), have been reported for patients who have received either formulation of Toradol.

Renal events - acute renal failure, flank pain with or without haematuria and/or azotemia; **Hypersensitivity reactions:** bronchospasm, laryngeal edema, hypotension, flushing, rash, and anaphylactoid reactions, such reactions have occurred in patients with no prior history of hypersensitivity. **Gastrointestinal events** - gastrointestinal hemorrhage, peptic ulceration, gastrointestinal perforation; **Hematologic events** - postoperative wound haemorrhage, rarely requiring blood transfusion (see PRECAUTIONS), thrombocytopenia; **Central nervous system** - convulsions, abnormal dreams, hallucinations, hyperkinesia, hearing loss; **Cardiovascular** - pulmonary edema; **Dermatology** - Lyell's syndrome, Stevens - Johnson syndrome, exfoliative dermatitis, maculopapular rash.

OVERDOSAGE: The absence of experience with acute overdosage precludes characterization of sequelae and assessment of antidotal efficacy at this time. In a gastroscopic study of healthy subjects, daily doses of 360 mg given over an 8-hour interval for each of five consecutive days (3 times the highest recommended dose) caused pain and peptic ulcers which resolved after discontinuation of dosing.

DOSAGE AND ADMINISTRATION:

Adults: Dosage should be adjusted according to the severity of the pain and the response of the patient. **Oral:** The usual oral dose of Toradol (ketorolac tromethamine) is 10 mg every 4 to 6 hours for pain as required. Doses exceeding 40 mg per day are not recommended. Toradol is recommended for short-term use only, i.e., for a maximum of a few weeks.

Parenteral: The recommended usual initial dose is 30 mg. Subsequent dosing may be 10 mg to 30 mg every 4-6 hours as needed to control pain. It is recommended that the administration of Toradol IM be limited to short-term therapy (not over 5 days) and the total daily dose should not exceed 120 mg.

This is because the risk of toxicity appears to increase with longer use at recommended doses (see WARNINGS and PRECAUTIONS). The administration of continuous multiple daily doses of Toradol IM has not been extensively studied. There has been limited experience with intramuscular dosing for more than 3 days since the vast majority of patients have transferred to oral medication or no longer required analgesic therapy after this time. In the initial post-operative period, more frequent dosing (e.g. every 2 hours) may be employed but the total daily dosing should not exceed 120 mg/day. If supplementary analgesia is required, a concomitant low dose of opiate can be used.

Patients under 50 kg, over age 65 years, or with less severe pain at baseline: the lower end of the dosage range (10-15 mg 4 times a day) is recommended.

Impaired Renal Function - Moderate - In patients with impaired renal function (serum creatinine values ranging from 1.9 to 5.0 mg/dL or 168 to 442 µmol/L), the total daily dose of Toradol should be reduced by half;

Severe - In patients with severely impaired renal function (serum creatinine values greater than 5 mg/dL, or 442 µmol/L) Toradol is not recommended.

Conversion from Parenteral to Oral Therapy: Toradol tablets may be used either as monotherapy or as follow-on therapy to parenteral ketorolac. Toradol IM should be replaced by an oral analgesic as soon as feasible. When Toradol tablets are used as a follow-on therapy to parenteral ketorolac, the total combined daily dose of ketorolac (oral + parenteral) should not exceed 120 mg on the day the change of formulation is made. Subsequent oral dosing should not exceed the recommended daily maximum of 40 mg.

Directions for Use of the Prefilled Syringes: Insert the plunger into the syringe barrel and thread it onto the screw. WITHOUT REMOVING THE NEEDLE GUARD, apply quick, firm pressure to the plunger to break the inner seal. (You will feel it let go). Pull back on the plunger slightly to relieve pressure. Remove the needle guard by twisting as you pull. Use the unit as you would a normal syringe. Dispose of properly. Single use only. Discard Unused Portions. Parenteral drug products should be inspected visually for particulate material and discoloration prior to use. Toradol (ketorolac tromethamine) is a Schedule F drug.

Stability and Storage Recommendations:

Toradol Tablets: Store at room temperature with protection from light.

Toradol IM: Store at room temperature with protection from light.

Availability of Dosage Forms: Toradol (ketorolac tromethamine) is available as 10 mg white round film coated tablets containing ketorolac tromethamine, microcrystalline cellulose, lactose and magnesium stearate with one side printed in red with TORADOL inside bold T and other side with Syntex. Toradol (ketorolac tromethamine) 10 mg tablets are available in bottles of 100 and 500 tablets.

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ies. In a study of 1,006 adults aged 20-65, over a three-year period, a 0.05 per cent NaF-containing rinse (225 ppm) was only able to significantly decrease the incidence of proximal root lesions — compared to a placebo — and no decrease was identified on other tooth surfaces.⁸³ When data from this study was analyzed for a specific subsample of high-risk individuals, significantly less caries (or a trend indicating this) was found in the fluoride mouth-rinsing group. Therefore, self-applied fluoride products for home use could be considered as part of an adjunctive preventive regimen for adults with recognized caries susceptibility.⁸³ Contrary to this, Raval and Birkhed⁸⁴ found that although a 0.05 per cent NaF rinse did not statistically reduce the occurrence of new decayed-filled root surfaces when compared to a five per cent NaF-containing varnish or 0.4 per cent SnF₂-containing gel, decreases were the most obvious with the NaF rinse.

2. Chlorhexidine

The antimicrobial rinse chlorhexidine gluconate (CHX) has been shown to inhibit plaque accumulation, and thereby inhibit caries formation⁸⁵⁻⁹¹ by decreasing acid production.⁹²⁻⁹⁴ The use of CHX rinses or gels significantly reduces mutans streptococci levels and caries susceptibility,^{93,95-98} maintaining suppression of mutans streptococci counts for at least six weeks following discontinuation.⁹⁹⁻¹⁰³ Highly concentrated CHX varnishes can produce long-term suppression of mutans streptococci on sites that have a predilection for caries,⁹⁹⁻¹⁰³ which has been shown to reduce caries production by reducing the demineralization of root surfaces.¹⁰⁴ The action of the antimicrobial agents released may be made either directly on the bacteria (e.g. through the saliva), indirectly by entering or being absorbed onto the dentin, and becoming active later, or by both mechanisms.¹⁰⁴

CHX can also be combined with fluoride. This combination is effective because:

- a) both inhibit bacterial acid production;¹⁰⁵⁻¹⁰⁷
- b) the ability of fluoride to reduce enamel solubility is not reduced by CHX;¹⁰⁸
- c) fluoride does not bind or affect the antimicrobial activity of CHX;¹⁰⁹ and
- d) mutans streptococci and caries levels can be reduced in humans.¹³⁸⁻¹⁴⁰

A one-minute daily rinse containing a combination of 0.05 per cent sodium fluoride and 0.2 per cent chlorhexidine was shown to prevent dental caries and enhance remineralization of carious lesions significantly better than fluoride alone,¹¹³ while similar results were demonstrated with a CHX/fluoride gel combination.^{114,115} Clearly, fluoride and CHX are more effective used in combination than when used separately.

Tertiary Prevention

Tertiary prevention aims at limiting the progression of the root caries lesion. This can be achieved by either reshaping the affected root surfaces or by definitive restorative procedures.

1. Reshaping of Affected Root Surfaces

Conservative debridement, cleansing and smoothing of the root surfaces is a reasonable alternative to placing a restoration in shallow root-carious lesions. In the removal of carious dentin, it is neither necessary nor desirable to remove all stained dentin to avoid the creation of an unacceptable surface defect that would require restoration. The purpose of recontouring and smoothing is to eliminate the soft and irregular diseased dentinal tissue, leaving a smooth and, ideally, non-retentive root surface capable of resisting further carious attack.¹¹⁶

Incipient and shallow root caries lesions have been treated successfully by smoothing and recontouring the lesions, in combination with topical fluoride therapy.¹¹⁷⁻¹¹⁹ In one study, root caries lesions treated in this manner remained

without lesion progression or recurrence over a two-year period, as long as fluoride therapy was continued.⁷⁷ This occurred even though it was known that bacterial ingress frequently extended beyond the depth of the area smoothed.¹²⁰ Another study demonstrated that streptococcus mutans levels could be reduced below pretreatment levels when the root caries lesions were excavated, recontoured and treated with fluoride.¹²¹ A CHX and fluoride combination should achieve comparable or superior results.

2. Placement of Restorative Materials

The traditional management of any carious lesion involves the excision of infected, necrotic, and partially decalcified dentin, and its replacement with biologically-acceptable materials having suitable physical and mechanical properties. With root caries, lesions approaching a millimetre or more in depth generally require the placement of a restoration. Consideration must be given to the large surface area susceptible to attack, with many lesions being extensive (involving more than a single aspect of the root surface) and the limited thickness of root dentin (compared to coronal dentin), especially the inter-dental surfaces of mandibular incisor teeth. The removal of carious root dentin from such surfaces potentially puts the dental pulp and therefore the whole tooth at great risk.

The restoration of teeth from which moderately extensive root caries has been removed poses a number of problems. Visibility and isolation from oral fluids (saliva, gingival secretions or blood) are particular problems, while the maintenance of pulpal integrity through the use of biologically-acceptable dressings to the pulp reduce the depth of lesions, but do not provide the esthetic, physical and mechanical qualities required of a restoration. Furthermore, the placing of any restoration into a cavity in curved surfaces is technically very difficult.

Generally, the restorative material of choice is a glass-ionomer

cement,¹²²⁻¹²⁴ because of its ability to adhere to dentin and the release of fluoride into the immediate vicinity of the restoration over a prolonged period of time.¹²⁵⁻¹³⁰ A clinical trial showed that teeth with root caries, restored with glass-ionomer restorations, remained caries-free over a 24-month period.⁷⁷ Plaque forming on glass-ionomer restorations might also have a lower potential to induce recurrent caries, because of the reduction of viable counts of mutans streptococci in samples taken from glass-ionomer restorations compared to samples obtained from amalgam restorations,^{131,132} and amalgam and composite resin restorations.¹³² Should amalgam or composite resin be used, the potential for microleakage and recurrent caries should be considered. To some extent, a fluoride varnish applied over amalgam and composite resin restoration margins following placement and at periodic recalls may reduce the potential for both microleakage and recurrent caries.

Conclusions

Guidelines for the treatment or restoration of active root caries lesions are summarized in **Table 1**. Following these guidelines can allow for the successful management of most active root caries lesions. In some circumstances, lesions can cease development and become arrested without any therapeutic intervention, however, little is known about the naturally occurring factors or events that promote this process. Arrested lesions generally do not require definitive treatment or restoration, unless, in the patient's view, esthetics is a problem. Whether arrested shallow or cavitated lesions require or would benefit from even restorative treatment is debatable. The potential for arrested lesions to become reactivated or to act as foci for the spread of potentially cariogenic organisms is unknown. However, in the absence of specific knowledge to the contrary, the general approach to the management of arrested root caries is to smooth or restore arrested lesions as if they are active when other active root lesions are present, oth-

TABLE 1

Guidelines For the Treatment Or Restoration Of Active Root Surface Caries*

1. Polishing Only		
	Indications	incipient lesions (no surface defect, soft, penetrated by dental explorer)
	Materials	flexible polishing discs, cups or points, and prophylaxis paste
	Advantages	non-invasive
	Limitations	access can be problematic, especially on proximal surfaces
	Adjunctive Treatment	topical fluoride and Chlorhexidine therapy
2. Recontouring and Smoothing		
	Indications	shallow lesions (surface defect 0.5 mm, soft, irregular, rough, penetrated by dental explorer)
	Materials	abrasive points, fine diamonds, flexible polishing discs, cups or points and prophylaxis paste
	Advantages	minimally invasive, no restoration required
	Limitations	access can be problematic, especially on proximal surfaces
	Adjunctive Treatment	topical fluoride and Chlorhexidine therapy
3. Restoration		
	Indications	Cavitated lesions (surface defect greater than 0.5 mm, soft texture)
	Materials	glass ionomer cements, conventional finishing and polishing instruments and supplies
	Advantages	minimal preparation, limited to removal of carious tissue, glass ionomer releases fluoride to surrounding tooth structure
	Limitations	access can be problematic, especially on proximal surfaces and at margins of amalgam and cast restorations
	Adjunctive Treatment	topical fluoride and Chlorhexidine therapy

* Adapted from Billings¹¹⁶

erwise they are left alone and treated preventively with self-applied topical fluorides.¹¹⁶

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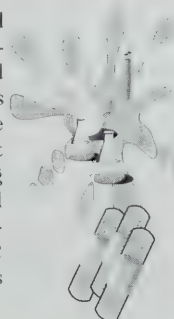
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In 1857 a Brooklyn, New York, chemist named Robert Chesebrough visited the site of the first oil strike in United States history in Titusville, Pennsylvania. The oil workers he talked with kept mentioning "rod wax" — a substance that collected on oil pumping machinery. They claimed it healed their cuts and burns.

Robert Chesebrough took a sample of the "wax" home to study and worked on refining it into a jelly-like product. He deliberately cut and burned himself and rubbed the Vaseline (a combination of the German word for water, vasser, and the Greek word for oil, elaion) on his wounds. He found that it did actually speed up the healing process.

In 1870 he set up a factory and started mailing samples to physicians and scientists around the country. They ignored him. He then went public. Loading his wagon with jars of Vaseline he rode around New York state handing them out to everyone. Soon people were taking their empty sample jars to their local druggists to order refills, and Chesebrough's business was launched. By 1912 Vaseline and its healing qualities was being written up in medical journals.





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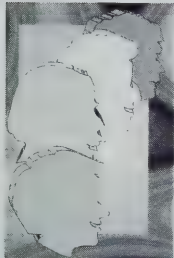
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The Use of Partial Dentures Incorporating Onlays In the Treatment Of the Worn Dentition

M.J. Barsby, PhD, BDS, FDS

Tooth wear is a life-long process that arises from a combination of natural physiological wear and the various "insults" to which the dentition is subjected throughout life. Exposure to erosive agents in the diet or gastric reflux, abrasive agents, and parafunctional habits such as bruxism and clenching may all play a part, to varying degrees, in the lifetime wear of the dentition.

In the elderly patient, occlusal loads may be concentrated on a depleted dentition, which influences the pattern of tooth wear and may also effect the jaw relationship (Fig. 1).

Partial dentures incorporating onlays are a useful treatment option for some elderly patients with advanced tooth wear. Although this is a relatively simple form of treatment, the need to correct changes in the jaw relationship may necessitate a prolonged initial treatment phase in order to allow time for the patient to adapt.

Patient Assessment

Careful patient assessment is essential prior to undertaking any treatment aimed at restoring the worn dentition. A thorough dental and medical history should be recorded, and a detailed clinical examination should be carried out together with certain investigations. These may include a complete radiographic survey of the mouth, articulated study casts and,



Fig. 1: The habitual occlusal relationship of a patient with advanced tooth wear and a depleted dentition.

frequently, the use of diagnostic appliances or the diagnostic modification of old dentures.

Perhaps the most important assessment decision, particularly with elderly patients, is to determine whether there is adequate justification to treat tooth wear or not. This will be strongly influenced by the patient's reasons for seeking treatment. These may include concerns about appearance, difficulties with chewing, or sometimes simply that the worn teeth have sharp edges that irritate the tongue, lips or cheeks. Occasionally, where the patient has an adequate functional dentition and appearance is not the prime concern, smoothing and polishing of the

sharp enamel edges is the only treatment required.

In younger patients with excessive tooth wear, the first priority is to identify (if at all possible) the causes of wear, and then institute preventative advice and/or treatment. Subsequent restoration of the dentition may involve a number of options including crowns, sometimes in combination with removable partial dentures. In older patients, who frequently have depleted dentitions, and where tooth wear is not rapidly progressive, simpler forms of treatment are usually preferable. The provision of partial dentures incorporating onlays is one such option. In cases of extreme wear, overdentures may be considered.¹

Aims Of Treatment

It is most important for the patient and operator to discuss and agree on the aims of treatment at the outset. During this discussion, the operator should explain that no treatment of tooth wear is instantaneous, and even when a removable appliance is used as the definitive restoration, a prolonged diagnostic phase of treatment may be necessary.

If the planned definitive treatment involves the provision of partial dentures incorporating onlays, it is important for the operator to ensure that the patient understands the limitations of this form of treatment. The key factor to consider is the difficulty of achieving a satisfactory appearance, as the junction between an appliance of this nature and the natural teeth may be visible. This will depend on a number of factors, such as the degree of tooth wear, which arch is being treated, and the patient's lip line, particularly when smiling. Thus, partial dentures with onlays generally provide acceptable appearance (Fig. 2) where there is extensive reduction in the crown height of the worn teeth, and the teeth/onlay junction is hidden by the lips during most normal activities.

Partial dentures with onlays do have a number of advantages, however, which are: the treatment is very conservative — there is no excessive destruction of sound tooth tissue; the patient has a removable appliance that is easy to adjust, characterize and service; and this appliance is less costly than fixed restorations.

Where gross changes in the jaw relationship have occurred that are affecting both function and appearance, it will be necessary to re-establish a more 'normal' relationship. This usually involves the use of some sort of diagnostic appliance, which may take the form of simple blocks of acrylic resin, to restore the edentulous areas with occlusal coverage of the worn teeth. Such an appliance is constructed to a tentative vertical dimension, and is easily modified until a tolerable restoration of occlusal height is achieved. It is important to remember that pa-

tients frequently expect treatment to be brief. However, the events that led to extreme tooth wear, accompanied by changes in the jaw relationship, have usually occurred insidiously over the patient's lifetime. A prolonged period of wearing a diagnostic appliance, which may be subjected to repeated adjustment and modification, is therefore frequently necessary to allow time for the patient's musculature to adapt to changes in the vertical and horizontal jaw relationship. If the patient has no previous denture-wearing experience, the diagnostic appliance has the additional value of establishing tolerance to denture wearing.

The acrylic resin diagnostic appliance must be tooth supported as much as possible, since a wholly tissue-supported appliance that increased the occlusal height would traumatise the underlying soft tissues, and, in the long-term, accelerate bone resorption. In addition, teeth prevented from making occlusal contact by such an appliance would be free to overerupt. It is important that the diagnostic appliance provides even occlusal contacts with all opposing teeth.

When both patient and operator are satisfied that the newly established occlusal vertical dimension is tolerated and comfortable, and that it has achieved the desirable effect on appearance and on the jaw relationship, then, and only

then, should the operator proceed to a more definitive restoration.

Some Aspects Of the Design and Construction Of Partial Dentures Incorporating Onlays

Onlays are rests that are extended to cover the entire occlusal or incisal surface of a tooth. Occasionally, they may be constructed entirely of metal, but in cases of severe tooth wear they are more often made from a combination of metal and acrylic resin.

Some important aspects of the design and construction of partial dentures incorporating onlays require consideration. Study casts mounted on a semi-adjustable articulator at a vertical dimension approximating that of the diagnostic appliance are essential. These casts should be surveyed to select the most favorable path of insertion.

If all of the teeth in the arch exhibit occlusal or incisal wear, it will usually be necessary to onlay all of them. It is essential that all opposing teeth are kept in occlusion, so that overeruption and undesirable tooth movements cannot occur.

Retention may sometimes be a problem, since, if there is severe loss of coronal tooth tissue, the choice of retentive undercuts for clasping may be restricted. Sometimes this may indicate the use of overdentures. The use of guiding



Fig. 2: Patient with a partial lower denture incorporating onlays on all teeth. The onlay/teeth junctions are hidden by the lower lip in most normal functions.

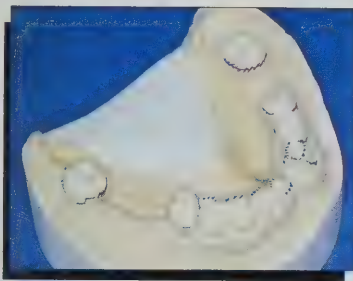


Fig. 3: Lower study cast of patient shown in Fig. 2. Sites marked in blue are sharp and weak enamel margins that require reduction; the lingual tooth margins should also be bevelled. Sites marked in red are areas of the teeth that require recontouring owing to unfavorable positioning of the survey lines.

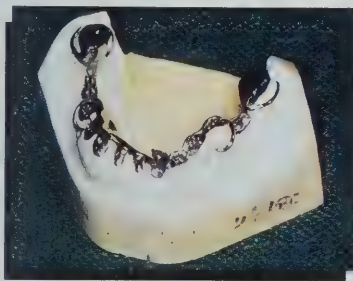


Fig. 4: The metal framework for a lower denture incorporating onlays. Note the metal coverage of incisal and occlusal surfaces does not extend to the labial or buccal surfaces (except on the molars).

planes will assist retention with conventional framework design.

At this stage, it is necessary to plan appropriate tooth preparation, which should be carried out prior to making the master impression. This preparation involves the removal of any unsupported enamel as well as bevelling any sharp angles at the junction of the occlusal (or incisal) and lingual or palatal surfaces of the teeth where the onlays will be attached to the major connector (Fig. 3). There are two reasons for doing this: one is to facilitate the best possible adaptation of the casting to the teeth, and the other is to prevent stress concentration within the framework, which would predispose to fracture.

After tooth preparation, the master impressions should be made with an elastomeric impression material. If possible, the impression should be poured twice or, alternatively, the master cast may be duplicated. The first poured cast will be used by the technician constructing the metal framework, while the duplicate cast is used for



Fig. 5: Trial setup on metal framework. Degree of tooth wear in this case has permitted the use of cut-down denture teeth for the onlays on the anterior teeth.

the construction of occlusal rims and the construction of any trial set-ups. This reduces the risk of damage to the master cast.

If onlays are required to improve appearance or if they are more than 2.0 mm in thickness, retention for acrylic resin must be provided on the occlusal (or incisal) surfaces of the casting. To avoid an unsightly tooth-to-metal junction in the finished denture, the metal should not extend as far as the labial or buccal surfaces of the teeth (Fig. 4). If sufficient occlusal height is available, the use of cut-down acrylic-resin denture teeth will provide a better appearance than tooth-colored resin processed onto the casting as an occlusal superstructure. Further, if denture teeth are used in this way, a trial setup must be produced and checked in the mouth before the metal casting is constructed, so that the occlusal height and tooth position can be verified. Retention tags and metal backings (if required) can then be sited in the best possible positions when the casting is made. Whatever form of occlusal surface is to be used (either metal or resin), accurate registration of the intended occlusal relationship is essential. This is done initially using the duplicate master cast. Once the metal framework has been constructed, new occlusal records should be made using the framework to support the occlusal registration material. The original master cast can then be articulated and the trial setup transferred to it (Fig. 5). A final trial insertion in the mouth is desirable at this stage, to check the occlusal relationship and to ensure that the transfer of denture teeth to the casting has been done accurately.



Fig. 6: Complete upper overdenture and partial lower denture incorporating onlays.

Once both patient and operator are satisfied with the trial denture setup in wax, it can then be processed. The use of tooth-colored resin may be necessary in some areas to provide the occlusal surface of the onlays, or to achieve an acceptable junction between the onlays and the natural teeth. If desired, staining of the denture teeth or onlays can be carried out after processing using resin-based paints (such as Minute-Stain, George Taub Products and Fusion Co. Inc., Jersey City, U.S.A.).

The 68-year-old patient shown in Fig. 6 has worn a complete upper overdenture for the last 25 years and a partial lower denture incorporating onlays for the last 10 years. The lower appliance has required replacement at approximately five year intervals, owing to wear of the acrylic resin onlays.

In favorable circumstances, this form of treatment can provide excellent results in the restoration of function and acceptable restoration of appearance for many patients with advanced tooth wear.

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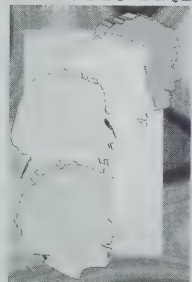
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Dr. Helene Shingles: A Life Dedicated To Geriatric Dentistry

P. Ralph Crawford, BA, DMD

This is the remarkable story of a dentist who has dedicated her life to the needs of the elderly. It's a very human story about a woman who rose from the devastation of war-torn Poland to begin a new life in Canada. And it's a story about what a single individual can accomplish when their spirit of giving unto others is stronger than their desire to serve the needs of self.

Dr. Shingles is a senior. Born August 12, 1917, in Warsaw, Poland, she received her degree in dentistry (doctor of stomatology) from the University of Warsaw in 1939 — the same year that Germany invaded her beloved homeland and plunged Europe into the Second World War.

Instead of becoming a year of achievement for Dr. Shingles, 1939 became a year of bitter memories and struggle. It was the year when her father was executed by the Nazis and the year when both her brother and husband perished in armed conflict. And it was the beginning of years of deprivation, horror and grief inside Nazi concentration camps for Dr. Shingles and her mother. But somehow, somehow, both survived.

Dr. Shingles was barely alive when General Eisenhower's forces eventually liberated Poland in 1945. To any of us who have not experienced the ravages of war, Dr. Shingle's story is almost incomprehensible. It is truly a moving experience to hear this small, frail



Dr. Helene Shingles, holding the 1986 Ontario Senior Achievement Award.

lady, with her gentle voice and soft caring eyes, matter of factly say: "The liberating army took those of us who were still breathing to the nearest military hospital — in my case, Tobruk, in North Africa — for medical treatment."

Dr. Shingles was only 28 at the time, and was told that she would probably not live beyond 40. But live she did. After two years in Tobruk, she travelled to Germany. There she joined up with a medical team working in a displaced persons camp for survivors of the concentration camps. In 1950 she emigrated to Canada, working first as a domestic on a Canadian farm, and then as a chemist in a factory in Wallaceburg, Ontario.

In 1953, Dr. Shingles was accepted into the faculty of dentistry at the University of Toronto. In those days there was no National Dental Examining Board examination system for foreign dental graduates, and Dr. Shingles was granted just one year's credit for her Warsaw doctor of stomatology degree. But she stayed the course, and graduated as a doctor of dental surgery in 1956.

After a one-year dental internship at Toronto General Hospital, Dr. Shingles established herself in private practice, first in Corunna, Ontario (in June 1957), and then in Sarnia (in 1960).

In 1976, Dr. Shingles retired from active private practice for

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No. 5

health reasons. It was then that she discovered a new career, one that ultimately brought dramatic changes to geriatric dentistry in Sarnia.

On her retirement from private practice, Dr. Shingles became more involved with volunteer work for seniors. While delivering "Meals On Wheels" to local seniors, she noticed that many meals were not being fully consumed. On inquiring why, she was told all too often that the seniors' apparent lack of appetite was actually a sign of dental problems — mostly poor dentures and badly deteriorated and neglected natural dentition.

"My days in the concentration camp came back to me," says Dr. Shingles. "We know the horror of pain, of abscesses, the denial of nutrition and personal hygiene. But that was war. When I see suffering today because of lack of care, it makes me very angry."

One must only talk to Dr. Helene Shingles for a short while to learn that she doesn't let a cause go unchallenged. In 1979, she went to the local medical officer of health in Sarnia and received permission to do a survey, without charge, of 950 home-bound and institutionalized seniors. The results only confirmed her initial observations — 95 per cent of those surveyed required dental care. And, of course, the survey only strengthened her resolve to do something about it.

In 1980, Dr. Shingles received the very sympathetic and understanding ear of a nursing home administrator at the Marshall Gowland Manor in Sarnia, and had soon established the first of a number of in-home dental treatment facilities for seniors in the Sarnia area. At the outset, Dr. Shingles donated her own equipment and supplies, but lack of money never seemed to be an insurmountable hurdle.

"If I really needed something very badly, I would plant an article in the newspaper and usually the response was quite good. And I can't forget my dental colleagues — they often came to my rescue. Also, Ash Temple, the dental supply house, many times they helped

me out with materials and sets of teeth."

To this day, Dr. Shingles works eight hours a day, five days a week. "It is really not the number of patients I see in a day, but just how many I can get around to treat. It is different working with seniors in a nursing home. Many are medically compromised and many are in wheelchairs, and treating patients in wheelchairs is back-breaking work. Of course, there is no money for lab work — I do all my own lab work, such as trays and repairs." Now in its 14th year, Dr. Shingle's program has grown from its modest beginning at the Marshall Gowland Manor to encompass four treatment facilities in Sarnia-Lambton County, plus dental services for the home-bound. All operated by a 76-year-old woman who was told to retire in 1976 because of ill health!

Dr. Shingles receives no fees and no salary. The only income she receives is from the county, who reimburse her for her annual dental license fee. She is reluctant to talk about money, her money. "I don't want to talk about my income. I don't want people to think I started as a volunteer and now want to make money from it." Dr. Shingle's patients do not pay for their dental treatment, but are asked to donate what they can. And Sarnia may be the only location in Canada where the dentist holds garage sales and rummage sales to raise money for geriatric dentistry.

Since 1982, when she was named to the Mayor of Sarnia's Honor List, Dr. Shingles has been the recipient of numerous provincial and international awards. But it was probably the 1986 Senior Achievement Award, presented by the province of Ontario, that convinced her that even more could be achieved for her beloved seniors. Shortly after receiving this award, Dr. Shingles was named to the Ontario Advisory Council for Seniors, a province-wide body convened to investigate the needs of the elderly.

"This nomination was a big boost for me. It seemed to open many new doors. People accepted me differently, talked to me and even called me for my advice. It

was a completely different atmosphere."

While Dr. Shingles' role on the Ontario Advisory Council has not directly affected her geriatric voluntarism in Sarnia, it has allowed her to place the elderly's need for dental services on the Council's agenda.

Although she's an earnest advocate of her cause, Dr. Shingles is not unrealistic. She philosophically accepts the fact that governments and dental organizations have many, many other problems, but she believes her role is to never let those agencies or the community forget the needs of the geriatric dental patient. Nor is she harsh on the institutions where the elderly are housed. "They just don't have the staff, they have no time. You can't blame the institution, you can blame the system."

Dr. Shingles worries about the future, of the days when she is no longer able to serve. "I'm getting old and really want the work to carry on. I would like to see the program put on a more permanent basis. So far, it has been entirely a volunteer effort. It's alright for me, I'm different. I'm single, and retired, and have no family responsibilities. We have to develop some type of program to at least compensate the younger dentists for their out of pocket expenses."

Dr. Shingles has already initiated some plans for the future. She has made a proposal to the county and to the city of Sarnia for the establishment of a geriatric dental foundation, which would raise and provide funds to ensure the ongoing provision of geriatric dental treatment.

Forever the visionary, Dr. Shingles says, "Hopefully, if the foundation is a success in Sarnia it will grow to be a model for the rest of the province."

Knowing Dr. Helene Shingles, there is little doubt that what she has accomplished in Sarnia will never be lost, but instead become a prime example of what dedication and determination can accomplish. ■



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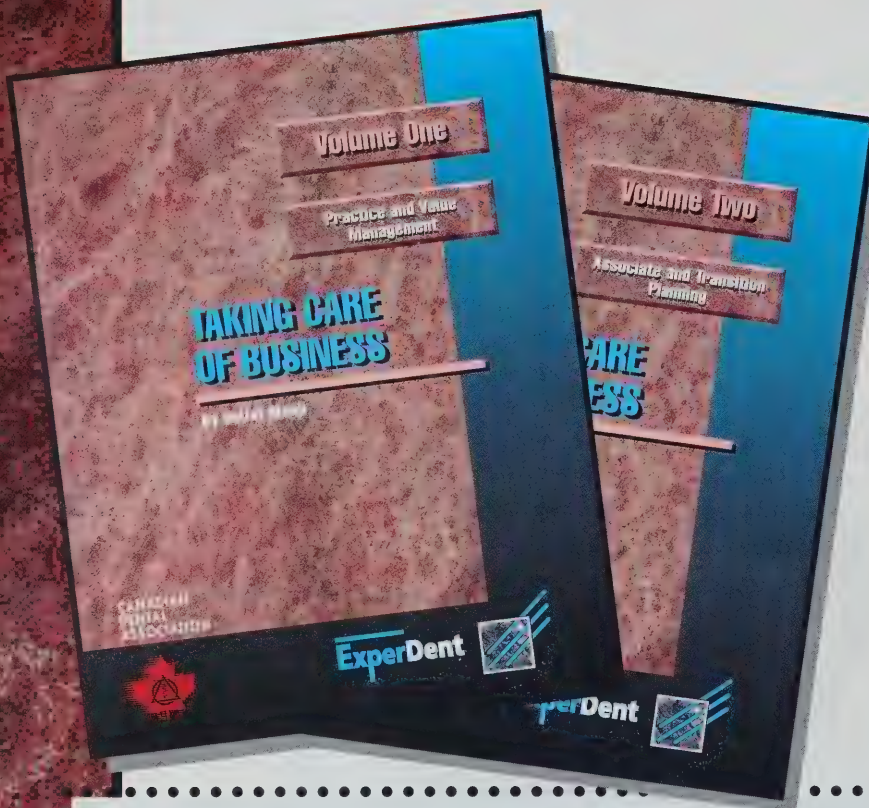
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Fibre Intake In Elderly Individuals With Poor Masticatory Performance

Danielle Laurin, P.Dt., M.Sc.

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ABSTRACT

The effects of masticatory performance on food selection and nutrient intake in non-institutionalized elderly subjects wearing dental prostheses were investigated. A poor masticatory performance was associated with significantly lower intakes of insoluble and dietary fibre for both sexes (as compared to subjects with a good masticatory performance) and with lower intakes of vitamin A in women only. Further, 37 per cent of subjects with low masticatory performance were taking gastrointestinal drugs, as compared to 20 per cent of subjects with good performance. A reduced consumption of hard-textured fibrous foods due to the deficient masticatory performance of elderly people wearing prostheses may promote the development of gastrointestinal disorders in susceptible individuals.

SOMMAIRE

Les effets de la performance masticatrice sur le choix alimentaire et les apports nutritionnels ont été évalués chez des sujets âgés non-institutionnalisés, porteurs de prothèses dentaires. Une faible performance masticatrice était associée à des apports significativement moindres en fibres alimentaires insolubles et totales comparativement à une bonne perfor-

mance. Un apport plus faible en vitamine A était également observé chez les femmes ayant une faible performance masticatrice comparé à celles ayant une bonne performance. Il est à noter que 37 p. cent des sujets qui présentaient une faible performance masticatrice prenaient une médication pour problèmes digestifs par rapport à 20 p. cent chez les sujets ayant une bonne performance. Une consommation réduite d'aliments durs à mastiquer, souvent à teneur élevée en fibres, pourrait entraîner le développement de problèmes gastro-intestinaux chez certains individus porteurs de prothèses dentaires fournissant une faible performance masticatrice.

Introduction

Studies in different countries have reported a decline in energy intakes by aging populations.^{1,2} This reduction may be partly explained by the diminution of both the basal metabolic rate and physical activity with advancing age. However, recommended nutrient requirements for the elderly have remained essentially the same. As reported in a previous literature review,³ several aging factors are known to contribute to diminishing food consumption in the elderly, such as loss of muscle tone in the stomach,

chronic constipation problems and therapeutic drugs. Dental status is a factor that also plays a key role in food selection and nutritional status. There is evidence that loss of teeth is associated with suboptimal intakes of nutrients and changes in food preference. Individuals with poor dentition tend to consume soft, easily-chewed foods that are low in fibre and usually have a low nutrient density. The masticatory efficiency of dental prostheses has been found to be one-sixth as great as the masticatory efficiency of a natural dentition.⁴

Several investigators have observed gastrointestinal disturbances associated with inadequate chewing.^{5,6} More recently, Mercier and Poitras,⁷ in a prospective study based on a therapeutic approach, have observed that masticatory failure can be involved in the genesis of gastrointestinal dysfunction and symptoms. Even though the link between dietary fibre and disease may be difficult to prove, the maintenance of the gastrointestinal function is recognized as a clear benefit arising from the consumption of high-fibre foods.⁸ In the present study, we examine the effects of the masticatory performance of elderly edentulous individuals, wearing complete dentures, on food selection, nutrient intake and gastrointestinal disorders.

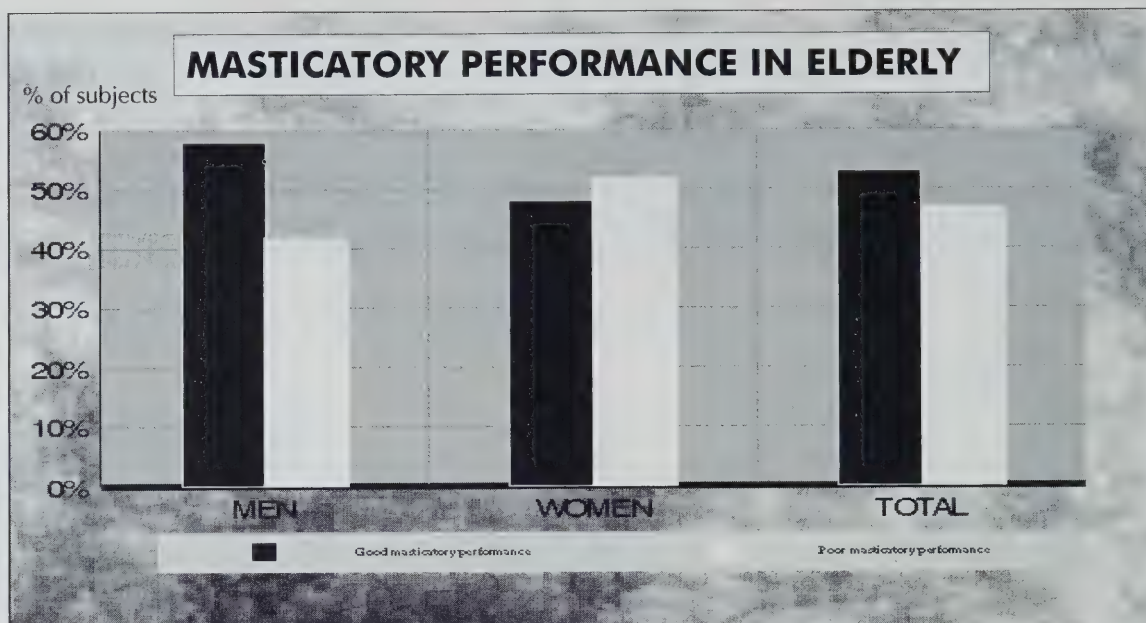


Fig. 1: Percentage of subjects according to denture status (N = 367).

Subjects and Methods

The study was carried out with the help of non-institutionalized healthy elderly subjects from the Quebec City area. Seven hundred and ninety-six subjects were randomly selected from the polling lists. Of these, 367 (158 men and 209 women), from 60 to 89 years old, agreed to participate and come to the Laval University School of Dental Medicine. Socio-demographic characteristics considered were: sex, age, education, smoking habits, marital status and residential status. Admission to the investigation required the following: to have been completely edentulous for at least two years; to have worn complete dentures for at least one year; and to have a free choice of food, with no restrictive diet. Details of the study were carefully explained to all participants, who provided informed written consent and were free to withdraw from the study at any time. Data collection took place during the months of May through October 1988.

Information was collected from questionnaires, by means of interviews, and from dental and medical examinations. A first questionnaire, administered by a research assistant, concerned the socio-demographic factors, smoking habits and prosthetic history of each subject. Afterwards, a dentist

carried out a dental examination to measure denture masticatory efficiency. The masticatory performance was evaluated using the Swallowing Threshold Test Index (STTI) of Chauncey et al.⁴ The score of this test was determined by instructing each participant to chew a blanched almond of about 1.5 g until it was ready to be swallowed. The chewed portion was then expectorated into a sieve with a 4.0 mm grid size. This procedure was repeated three times. Volumes of food were measured following a centrifugation at 1,500 rpm for three minutes. The masticatory performance was calculated by dividing the volume of test food passing through the sieve by the total volume of recovered food, multiplied by 100. A score of 0 to 79 indicated a low masticatory performance, whereas a score of 80 and over indicated a good masticatory performance.

The use of prescription or over-the-counter drugs and the prevalence of gastrointestinal disorders were determined using two checklists and a medical examination by a physician. Participants were asked to bring their medications with them to the exam to increase the reliability of the information. Dietary data were collected by a dietitian on a sub-sample of 310 subjects (131 men and 179

women) using the food frequency questionnaire of Krondl et al.,⁹ which had been previously validated for our population. Frequencies of food consumption for the last month were obtained from 220 food items usually eaten by elderly people in the Quebec City area. Subjects were asked to estimate portion sizes using food models. The nutrient intakes were calculated, with assisted analysis, by the Canadian Nutrient File¹⁰ data base using a software program developed by the Epidemiology Research Group of Laval University. The adequacy of nutrient intakes was assessed using the 1990 Nutrition Recommendations.¹¹

Statistics

All data were analyzed using the ANOVA procedure of the SAS package (Statistical Analysis System Institute Inc., Cary, N.C.). Statistical evaluation of means was performed according to the Student's T-test, all p values being two-tailed. Chi squares were also calculated to compare percentages of distribution of subjects. Logistic regression model analysis was used to compute the odds ratios, and their 95 per cent confidence intervals, to assess the relationships between dietary intakes and masticatory efficiency. Odds ratios (OR) were adjusted for sex, age, income,

education, smoking and denture wearing habits, age at complete edentation, marital and residential status. Nutritional data were stratified according to sex because most dietary intakes were statistically higher in men than in women.

Results

Prosthetic Status

The denture status of subjects (i.e. good (GMP) or poor (PMP) masticatory performance) is displayed by percentage in Fig. 1. Almost half of the participants (47 per cent) were classified as having dentures that provided poor masticatory performance according to the STTI test. This phenomenon was higher in elderly women (52 per cent) than in men (42 per cent) ($p = 0.06$). Logistic regressions further determined other factors associated with the masticatory performance. Thus, chewing efficiency was significantly lower when subjects were women (OR = 1.77, $p < 0.05$), when subjects were living alone (OR = 1.74, $p < 0.05$), or when subjects were wearing their dentures occasionally (OR = 9.05, $p < 0.001$).

Nutritional Data

All vitamin and mineral intakes of the study subjects met the Canadian recommended nutrient intake levels,³ except in the case of vitamin D, where intakes were inferior to the recommended level in both groups of women (GMP and PMP). Mean nutrient daily intakes of participating subjects are shown in Table I. Women with poor masticatory performance ingested 13 per cent less vitamin A than women with good performance ($p < 0.05$). A similar decrease was also observed in male subjects, but was not statistically significant. No dif-

TABLE I
Mean Nutrient Daily Intakes Of Men and Women
(n = 310)

Nutrient	Men		Women	
	GMP	PMP	GMP	PMP
Vitamin A (RE)	1,965	1,723	2,005	1,723*
Thiamin (mg)	1.9	1.9	1.4	1.5
Riboflavin (mg)	2.2	2.1	1.8	1.8
Niacin (NE)	37.4	37.2	29.5	27.9
Vitamin B ₆ (mg)	2.2	2.1	1.9	1.8
Vitamin B ₁₂ (mcg)	5.5	4.7	5.0	4.7
Vitamin C (mg)	167	148	186	172
Vitamin D (IU)	262	223	154	177
Vitamin E (mg)	16.1	16.7	12.4	11.9
Iron (mg)	17.4	18.2	14.1	13.8
Calcium (mg)	1,011	920	869	831
Phosphorus (mg)	1,547	1,510	1,306	1,243

GMP (dentures providing good masticatory performance)

PMP (dentures providing poor masticatory performance)

* Significantly different from women with good masticatory performance ($p < 0.05$; t-test).

ferences in intake levels of thiamin, riboflavin, niacin, or vitamins B₆, B₁₂, C, D and E were noted. Further, no statistically significant differences were noted in iron, calcium or phosphorus intake levels. On the other hand, subjects having poor masticatory performance consumed 11 per cent and 13 per cent less insoluble and dietary fibre, respectively (both $p < 0.01$), than subjects with good masticatory performance (Table II). These differences were more marked among women. The reduced intakes of vitamin A and fibre were mainly accounted for by a 14 per cent decrease in fruit and vegetable consumption by both men and women ($p < 0.05$).

Gastrointestinal Disorders

Data relating the use of medication to treat gastrointestinal disorders to the participants' masticatory efficiency revealed that a poor masticatory performance brought about a significantly higher use of drugs as compared to participants with good performance (OR = 2.36, $p < 0.001$), especially when participants were female (OR = 1.99, $p = 0.01$). Hence, 37 per cent of subjects with low masticatory performance admitted taking gastrointestinal drugs as compared to 20 per cent of subjects with good performance ($p < 0.001$). Drugs reported to be more selected among subjects with poor masticatory performance included: laxatives (19

TABLE II
Mean Fibre Intakes ($\pm$ SD) Of Men and Women (n = 310)

Nutrient	Men		Women		Total	
	GMP	PMP	GMP	PMP	GMP	PMP
Insoluble fibre (g)	9.0 $\pm$ 4.8	8.4 $\pm$ 4.5	10.7 $\pm$ 5.4	8.5 $\pm$ 3.6*	9.9 $\pm$ 5.2	8.5 $\pm$ 4.0†
Dietary fibre (g)	19.0 $\pm$ 9.2	17.2 $\pm$ 9.2	21.3 $\pm$ 8.8	17.8 $\pm$ 7.5*	20.2 $\pm$ 9.0	17.6 $\pm$ 8.2†

* Significantly different from women with good masticatory performance ($p < 0.01$; t-test).

† Significantly different from men and women with good masticatory performance ($p < 0.01$; t-test)

**TABLE III****Mean Fibre Intakes ($\pm$ SD) of Men and Women Taking Gastrointestinal Drugs (n = 87)**

Nutrient	Men		Women		Total	
	GMP	PMP	GMP	PMP	GMP	PMP
Insoluble fibre (g)	8.4 $\pm$ 4.7	6.7 $\pm$ 2.6	12.9 $\pm$ 9.8	8.1 $\pm$ 3.3*	10.6 $\pm$ 7.8	7.8 $\pm$ 3.2*
Dietary fibre (g)	18.5 $\pm$ 10.4	14.6 $\pm$ 6.1	24.0 $\pm$ 14.1	16.8 $\pm$ 6.6*	21.2 $\pm$ 12.4	16.3 $\pm$ 6.5 [†]

* 0.05 < p < 0.10

[†] Significantly different from men and women with good masticatory performance (p < 0.05; t-test)

per cent vs nine per cent, p < 0.01), gastroesophageal anti-reflux (eight per cent vs two per cent, p < 0.01) and antidiarrheics (three per cent vs zero per cent, p < 0.05).

Analysis of data from subjects on drug therapy (n = 87) revealed corroborating evidence. Women with low masticatory performance ingested 25 per cent less vitamin A (1,758 $\pm$ 974 vs 2,351 $\pm$ 1,134 RE, p = 0.06) than women with good performance. The vitamin C intake of men showing poor masticatory performance was 36 per cent lower than men showing good performance (112 $\pm$ 53 vs 174 $\pm$ 87 mg, p < 0.05). Significant differences in fibre intake by men and women were also observed (Table III). Fibre intake by subjects with poor masticatory performance was 26 per cent (p = 0.06) and 23 per cent lower (p < 0.05) for insoluble and total dietary fibre respectively, as compared to those with good masticatory performance. Statistical analysis revealed that dentures providing poor masticatory performance resulted in a 23 per cent (p < 0.05) decline in the consumption of fruits and vegetables.

Discussion

A few interesting observations were noted between groups of elderly subjects with good and poor masticatory performance. In this study, dentures exhibiting poor masticatory performance were significantly associated with decreased intakes of vitamin A, insoluble and dietary fibre. These reductions of nutrients were mainly attributed to a diminished consumption of fruits and vegetables. Analysis also revealed that elderly individuals taking drugs ate fewer fruits and vegetables, which con-

tributed to lowered intakes of vitamin A, vitamin C and fibre.

Edentation has been reported to lead to lowered nutrient intakes. However, some studies have observed changes in food selection without obvious effects on nutrient intake.^{12,13} In this investigation, no nutrient intakes were below the recommended levels except for vitamin D in female subjects. However, vitamin D intakes of women with good and poor masticatory performance were both below the recommended value, with no significant difference between the two groups. The dietary requirement for this vitamin in the elderly was recently increased to 200 IU per day because of suboptimal levels of main circulating and active forms of vitamin D in the serum, a less efficient absorption of calcium and vitamin D, and a reduced exposure to sunlight.¹¹ Despite the lowered intakes of vitamins A and C by participants with poor masticatory performance, intake values remained within the recommended limits. Nonetheless, these reductions in vitamin intake corroborate the results noted in the general food pattern, that is: the diminished consumption of fruits and vegetables, two categories of foods that are sources of vitamins A and C.

Investigators have frequently failed to look at the fibre content in the diets of edentulous subjects, despite the known fact that this population tends to avoid hard-textured foods.¹⁴⁻¹⁶ This negligence is noteworthy in view of the accumulating evidence on the beneficial effects of dietary fibre.¹⁷ Indeed, an increased intake of fibre and starchy foods has been recommended in the treatment or preven-

tion of many diseases such as dumping syndrome, hyperlipidemia, gallstones, diabetes, Crohn's disease, constipation, irritable bowel, diverticular disease, and colon cancer.¹⁸ Mercier and Poitras⁷ reported that the change to a diet of normal texture could explain the improvement in stool transit in their subjects following jaw reconstruction. In the current study, elderly subjects with dental prostheses that provided a poor masticatory performance were shown to ingest significantly higher amounts of medication for treating gastrointestinal disorders. The reduced consumption of fibre by subjects due to inefficient masticatory performance could partly explain the higher incidence of gastrointestinal disorders. Female subjects seemed more susceptible to such disturbances. Women with poor masticatory performance had significantly lower intakes of insoluble fibre (21 per cent) and of dietary fibre (16 per cent) than women wearing prostheses providing good performance. No significant differences were observed between the two groups (GMP and PMP) of men.

Organizations such as the Canadian Expert Advisory Committee On Dietary Fibre¹⁹ have recommended an increased intake of fibrous food for the treatment or prevention of a range of intestinal disturbances. A diet rich in fibre should provide 30 grams of dietary fibre daily. Fruits and vegetables are effective in shortening transit time and increasing fecal weight because they contribute both to increased fibre residue and microbial mass.⁸ Insoluble fibre contributes to colon regulation by increasing fecal bulk and decreasing transit



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In summary, a dental prosthesis that provides good masticatory performance allows an unrestricted food selection. This seems to ensure a certain protection against gastrointestinal disorders in the elderly, especially in elderly women. Restoring inefficient dentures would therefore be indicated in elderly individuals. However, the elderly do not always adapt readily to major changes made to their dentures. In these cases, or when restoration is not possible for various reasons, dietary counselling could be of assistance to the elderly. The importance of dietary counselling has often been recognized when modifications in food habits are necessary. Using individualized advice, the dietitian can induce an elderly individual with poor masticatory performance to increase fibre intake. Higher introduction of fibre without extensive chewing can be managed by: higher consumption of whole grain products; the addition of bran on cereals, soups or desserts; grating or chopping small fresh fruits and raw vegetables, etc. Furthermore, appropriate dietary counselling would take into account other factors known to restrain food choice, such as psychological, sociological and economic aspects. ■

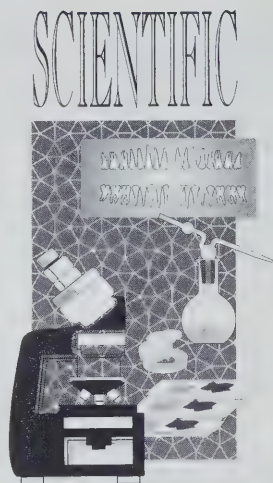
This study was supported by the National Health Research and Development Program.

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Herpes Zoster of the Trigeminal Nerve: The Dentist's Role in Diagnosis and Management

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ABSTRACT

Herpes zoster is caused when the varicella/zoster virus that has remained latent since an earlier varicella infection is reactivated. During the prodromal stage, the only presenting symptom may be odontalgia, which may prove to be a diagnostic challenge for the dentist. He or she may carry out emergency treatment that might be irreversible or inappropriate, as well as delay appropriate treatment. With an ever-increasing number of elderly and immunocompromised patients attending the dentist, the dental profession can expect to encounter an increased number of herpes zoster patients. The practising dentist must be familiar with the presenting signs and symptoms of patients experiencing the prodromal manifestations of herpes zoster of the trigeminal nerve.

SOMMAIRE

L'herpès zoster ou zona est causé par le virus de la varicelle qui est réactivé après être resté latent à la suite d'une infection passée. En phase prodromique, le seul symptôme peut être une odontalgie qui, pour le dentiste, peut s'avérer un diagnostic difficile à poser. En effet, celui-ci risque ou d'effectuer un

traitement pouvant être irréversible et inapproprié, ou de retarder un traitement qui serait approprié. Avec le nombre toujours croissant de personnes âgées ou accusant un déficit immunitaire qui se présentent chez le dentiste, la profession peut s'attendre à voir un plus grand nombre de patients avec un zona. Aussi le praticien doit-il apprendre à en reconnaître les signes et les symptômes chez les patients qui en présentent les manifestations prodromiques au nerf trijumeau.

Herpes zoster (shingles) is a condition that has plagued mankind for centuries. The relationship between herpes zoster and varicella (chicken pox) was recognized by von Bokay¹ in 1888, when he observed that children exposed to the former condition could develop the latter. The varicella/zoster virus (VZV) was isolated from virus-infected human tissue cultures in 1953 by Weller and Coons.² They suggested that the same virus was the causative agent of both varicella and herpes zoster.²

The varicella/zoster virus produces two distinct clinical syndromes. Varicella is an ubiquitous, highly contagious, generalized skin eruption. It spreads rapidly in a susceptible population and dis-

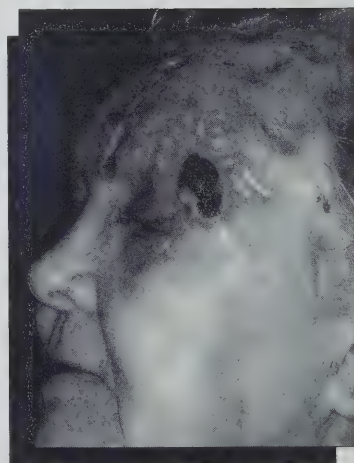


Fig. 1: Herpetic zoster of the ophthalmic division of the trigeminal nerve in a 67-year-old immunocompromised female.

plays marked seasonality. Zoster (shingles) is a less common endemic disease. It usually occurs in older and/or immunocompromised individuals, and is characterized by a painful vesicular eruption that is generally limited to a single dermatome. While varicella represents a primary infection, herpes zoster appears to be an infection that is secondary to the reactivation of VZV that has remained latent since an earlier varicella infection.³

The onset of the infection is characterized by a skin rash, which is usually limited to the cutaneous

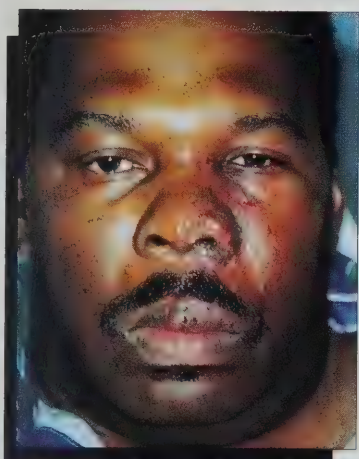


Fig. 2: Herpetic zoster of the second division of the trigeminal nerve.



Fig. 3: Herpes zoster of the third division of the trigeminal nerve.

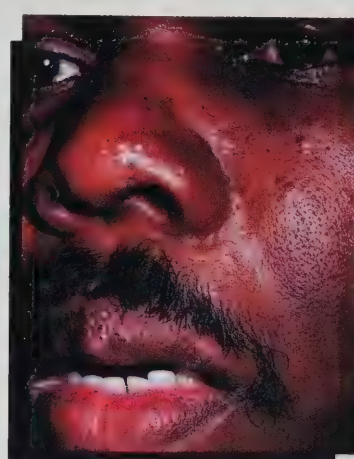


Fig. 4: Early cutaneous vesicular eruption of the second division of the trigeminal nerve.

distribution of a single sensory nerve ganglion. While the majority of infections affect the dermatomes of T3 to L2, a significant number of patients (13 per cent) present with infections limited to either the first (**Fig. 1**), second (**Fig. 2**), or third (**Fig. 3**) divisions of the trigeminal nerve.⁴ A very significant feature of this disorder, and one which can prove to be a diagnostic challenge for the practicing dentist, is the occurrence of a prodromal stage in which pain mimicking pulpal or other dental disorders can be the initial and at times the only presenting symptom.^{4,5} In addition, the patient may complain of a burning, itching or tingling sensation in the skin over the affected nerve distribution, as well as a deeper stabbing or aching neuralgia type of pain.^{4,5} With these symptoms presenting possibly several days prior to the typical vesicular skin eruption, arriving at a definitive diagnosis may be difficult, and the risks of instituting inappropriate therapy must be borne in mind.^{4,6} Aside from the hazards involved in misdiagnosis and mistreatment, it is becoming increasingly clear that the institution of early and appropriate antiviral systemic therapy is essential if the duration and severity of this infection is to be shortened, and the painful sequela of postherpetic neuralgia is to be minimized.^{4,6}

Report Of a Case

A 54-year-old black male presented to the dental clinic com-

plaining of a diffuse but sharp pain in the left maxilla. He indicated that the pain seemed to be concentrated in the first and second molar region. It had started suddenly the previous evening, and he stated that he had experienced no previous pain in this area.

The patient appeared well nourished and was afebrile. He was receiving treatment for hypertension, which was controlled by enalapril (Vasotec) and verapamil (Isoptin). Clinically, the left maxillary first and second molars were periodontally involved, had severe buccal abrasion, gingival recession, and sulcal pockets measuring 4.0 to 7.0 mm in depth. The second molar was heavily restored with a large DO amalgam restoration. There was no abnormal sensitivity to percussion, no sulcal exudate, and no apical radiolucency. The opposing arch was edentulous in this region. Given these clinical and radiographical findings, combined with the intensity of the patient's pain, it was felt that, in spite of the patient's impression that the pain was of dental origin, other conditions must be included in the differential diagnosis. On closer examination, very small, inconspicuous vesicles were observed on the skin of the left nasal alar base, the left upper lip and the left palatal mucosa (**Fig. 4**).

Given the above findings, herpes zoster of the left maxillary division of the trigeminal nerve, periodontal infection of the left

maxillary second molar, maxillary sinus disease and neuralgia were considered in the differential diagnosis. Since herpes zoster was considered to be the most likely diagnosis, the patient was immediately referred to the Infectious Disease Service, where a smear confirmed the presence of a herpes infection. The nature of the infection was then explained to the patient. He was immediately placed on acyclovir 800 mg p.o. five times daily for seven days, magnesium hydroxide (Milk of Magnesia) oral rinses, a high protein liquid food supplement and ibuprofen 600 mg q6h prn for pain.

On day 3, the patient presented with a characteristic herpes zoster rash. The skin of the infraorbital region, the left side of the nose, and upper lip were covered with discrete vesicles and pustules that extended precisely to the midline. The facial soft tissues were edematous and very painful (**Fig. 2**). Intraorally, the mucosa of the left hard palate was covered by multiple small ulcerations extending precisely to the midline (**Fig. 5**).

On day 8, the patient presented with broken and crusted skin lesions. The intraoral lesions were healing. The patient was eating normally but still required oral analgesics (**Fig. 6**).

On day 13, the patient presented to the hospital emergency department complaining of pain in the left eye. Antibiotic eye drops were prescribed.



Fig. 5: Herpes zoster lesions affecting the palatal mucosa.

On day 16, the patient presented to the dental clinic complaining of severe pain in the region of the left maxillary sinus. An otolaryngology consultation was requested. The consulting specialist felt that the patient was suffering from postherpetic neuralgia. The patient was referred for assessment and pain management to the neurological service. He was placed on a course of carbamazepine (Tegretol) 300 mg twice daily. This medication, however, was stopped after a few days due to drug intolerance. In addition, the patient took amitriptyline (Elavil) 25 mg twice daily for a period of one and a half months with only a limited benefit.

At a three-month follow-up, the patient was still suffering from postherpetic neuralgia of the left maxillary region and was experiencing paresthesia throughout the distribution of the left maxillary division of the trigeminal nerve.

At a six-month follow-up, the intraoral paresthesia had resolved, although paresthesia of the patient's left nostril and sensitivity of the upper lip and cheek persisted. A deeper pain in the left maxillary sinus region also persisted. Superficial scarring of the healed skin lesions was also noted (Fig. 7).

At a one-year follow-up, the patient reported sensitivity to touch of the skin of the affected area and a persistent low grade pain that did not require medication for control. He is currently receiving comprehensive dental care and continues to be monitored by the staff of the dental clinic.

Discussion

This case of herpes zoster is of unusual interest to the dentist, since it presented in the prodromal



Fig. 6: The normal progression of facial herpes zoster, indicating the broken and crusted skin lesions.

stage as a dental emergency with a chief complaint of odontalgia. The dentist has a vital role in the early diagnosis, treatment and management of a herpetic infection, which may present as a "toothache." Cases have been reported where misdiagnosis has led to dental extractions and other irreversible dental treatment. In cases of acute onset of odontalgia, with no substantiating dental signs, herpes zoster should be included in the differential diagnosis. The characteristic rash is not visible in the prodromal stage, nor in a zoster sine herpete, where no rash occurs.⁶ In rare instances, more severe oral complications have been reported, including tooth devitalization, tooth exfoliation, internal root resorption, tooth neuralgia and osteonecrosis.^{7,8}

The pathophysiology of herpes zoster is not well understood in spite of a significant increase in the information now available concerning the whole family of herpes viruses.^{9,10} From the area of primary infection, varicella/zoster viruses are believed to travel intra-axonally in sensory nerves to the ganglia, where they may persist in a latent form.³ The mechanisms behind the establishment of a latent viral infection and reactivation of the viruses are poorly understood.

Faced with a patient who is suffering from severe pain in the acute phase of the infection, and given the possibility that the patient will experience a profound and protracted postherpetic neuralgia, which could persist for a number of months or even years, institution of early antiviral therapy would seem to offer these patients the best possible chance of minimizing the severity of the infection and of reduc-

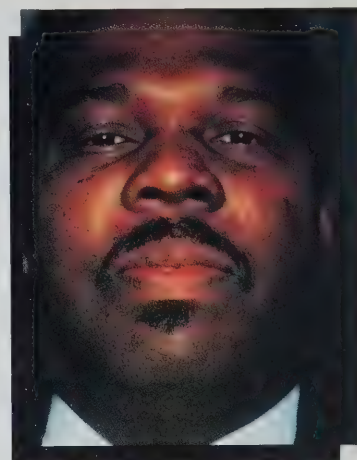


Fig. 7: Six month follow-up indicating the superficial scarring of the healed skin lesions.

ing tissue damage. While a variety of antiviral agents have been studied in relation to the management of herpes zoster infection, the most widely accepted regimen at present is oral or intravenous acyclovir administered for a minimum of seven days.¹¹ McKendrick et al, in a double-blind random study involving 205 patients who received acyclovir or placebo, found that acyclovir administration was associated with significantly accelerated healing when treatment was initiated within 48 hours of the onset of rash. Analysis of average daily pain scores showed a highly significant pain reduction in the acyclovir group compared with the placebo group. Whether acyclovir administered during the acute phase of the infection has any beneficial effect in minimizing the symptoms of postherpetic neuralgia has yet to be established.¹¹

While reports of the beneficial effects of steroid administration have been reported in the literature, the possible value of this form of therapy has yet to be confirmed.¹²

Ophthalmic herpes zoster or zoster of the first division is the most frequently occurring herpes zoster infection affecting the trigeminal nerve. Ocular complications occur in approximately 50 per cent of patients with ophthalmic herpes zoster.¹³ These complications, which are presumably related to viral spread, neural damage, ischemic vasculitis and

inflammatory immune response, can result in serious ocular damage.¹³ Prompt referral of herpes zoster patients for ophthalmologic evaluation is the prudent course of action when patients present with any complaints relating to the orbital region.

In evaluating the distribution of vesicles on the middle third of the face, one must be aware that the sensory innervation of the skin overlying the side of the tip of the nose is supplied by the nasociliary branch of the ophthalmic division of the trigeminal nerve. If Hutchinson's sign (cutaneous zoster of the side of the tip of the nose) is present, then the probability of ocular involvement increases significantly.¹⁴ In this case, the ophthalmologist reported that there was no clinical evidence of ophthalmic zoster. The presence of nasal lesions in this patient, therefore, can be attributed to either a partial involvement of the ophthalmic division, or an extension of lesions beyond the normal distribution of the infraorbital branch of the maxillary division of the trigeminal nerve.

It has been reported that postherpetic neuralgia is especially common following trigeminal herpes zoster and occurs in about 20 per cent of these cases at all ages, but in 50 per cent of patients over 60 years of age.^{4,10} Management of pain during the acute infection and in the postherpetic phase is problematic. Effective pain management in every case has yet to be realized. The usually-prescribed centrally- and peripherally-acting analgesics seem to have only a minimal beneficial effect. Amitriptyline (Elavil) and other tricyclic antidepressants, carbamazepine (Tegretol) and phenothiazines have all been employed in an attempt to minimize the painful sequelae of this infection. Only a limited success has been reported to date.

Topical capsaicin (Zostrix, Axsain) has been suggested for temporary relief of neuralgia following herpes zoster infections.¹⁵ The mechanism of action apparently involves the depletion of substance P in the peripheral sensory neurons, rendering the skin less sensitive to

pain. Hawk and Millikan¹⁶ have reported a case in which a 66-year-old man with an 18-month history of postherpetic neuralgia was unresponsive to trials of chlordiazepoxide, amitriptyline, propoxyphene, aspirin, codeine and triamcinolone acetanide. Application of capsaicin 0.025 per cent cream four times a day to the affected areas of the oral mucosa decreased the pain within two days, and complete relief was achieved after four weeks of use.¹⁶ Further clinical studies are needed to confirm the potential value of capsaicin in the management of postherpetic neuralgia.

Summary

The practising dentist must be familiar with the presenting signs and symptoms of patients experiencing the prodromal manifestations of herpes zoster of the trigeminal nerve. In an effort to relieve the discomfort of herpes zoster, the dentist may be tempted to provide emergency dental care that is inappropriate and could result in irreversible and/or inappropriate dental treatment. In these cases, when herpes zoster is suspected, prompt referral for medical evaluation and therapy can materially aid the patient by reducing the severity and the duration of the infection. It is anticipated that due to an ever-increasing number of elderly patients and immunocompromised patients, the dental profession can expect to encounter increased numbers of herpes zoster patients in the future. ■

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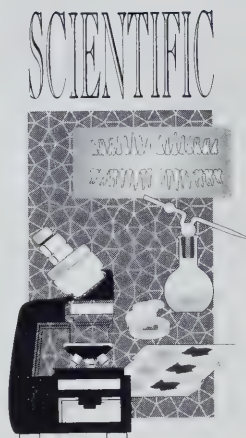
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Vol. 60
No. 5



The Acidity (pH) and Buffering Capacity of Canadian Fruit Juice and Dental Implications

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ABSTRACT

Excessive consumption of acidic fruit juices is associated with dental morbidity. The pH and buffering capacities of fruit juices packaged and consumed in Canada were measured, and the implications on dental pathology of consuming juices of these qualities are discussed. Canadian fruit juices have a pH below the critical dissolving pH of enamel, and have buffering capacities similar to juices produced and consumed elsewhere in the world. Citrus, apple, and grape juice, or blends of these juices, are all potentially hazardous to teeth. Erosion, attrition, decay and dentinal hypersensitivity may all result from abusive juice drinking.

SOMMAIRE

La consommation excessive de jus de fruits acides est liée à la morbidité dentaire. Le pH et le pouvoir tampon des jus de fruits conditionnés et absorbés au Canada ont été mesurés et les répercussions de la qualité de ces jus sur la pathologie dentaire ont ensuite été examinées. Les jus de fruits «cana-diens» affichent un pH inférieur au pH dissolvant critique de l'émail et ont également un pouvoir tampon comparable aux jus produits et consommés dans les autres pays du monde. Les jus de

d'agrumes, de pomme, de raisin et les mélanges de ces jus sont tous potentiellement dangereux pour les dents. L'érosion, l'attrition la carie et l'hyper-sensibilité dentaire sont autant de phénomènes attribuables à une consommation abusive de jus de fruits.

Introduction

Fruit and fruit juices are produced and enjoyed worldwide. In Quebec, for example, apple growing is a \$35-million-a-year industry. Nearly 1,000 apple producers harvest more than 6.4 million bushels (about 114-million kilograms) of apples in an average year. Half of this harvest is sold as fresh apples, but over one-million bushels (about 18-million kg) are processed to juice.¹ The magnitude and profits of the international juice industry are such that corporate juice processors and marketers are listed on international stock markets, and orange juice concentrate, in its own right, is traded as a bulk commercial commodity.²

An increase in the production, marketing and consumption of fruit juices over recent decades has generally been ignored by most health professions. The inclusion of fruit or fruit juice in the diet is generally regarded as being healthy and a good source of Vitamin C.³ How-

ever, excessive drinking of fruit juice is not without risk, and the dental profession has cautioned against this.⁴⁻⁹

Fermentable sugars (including glucose, fructose and sucrose) and many organic acids are ubiquitous in fruit.^{9,10} There are more than 23 known organic acids. In ripe fruit, the predominant free acids are: malic (in apples, apricots, bananas, cherries, grapes), citric (in lemons, oranges, black and red currants, figs, gooseberries, guava, loganberries, pineapples, pomegranates, raspberries and strawberries) and tartaric (in grapes).¹¹ These and many other weak acid radicals, primarily in association with potassium, constitute acid juices with strong buffering systems.¹²⁻¹⁴

A significant amount of Vitamin C occurs naturally in most fresh fruits. In spite of the fact that some of this Vitamin C is lost during the juicing process, it contributes to fruit-juice acidity.^{3,15} By itself, ingesting pure Vitamin C causes enough of a short-term increase in salivary acidity to result in dental decalcification.¹⁶ Drinking large amounts of fruit juice is frequently causally related to dental morbidity, including erosion, attrition, abrasion, increased dentinal sensitivity and decay.¹⁷⁻²²

Saliva slowly neutralizes dietary acids, thereby minimizing or controlling decalcification.^{20,23} In fact, calcium and phosphate levels in

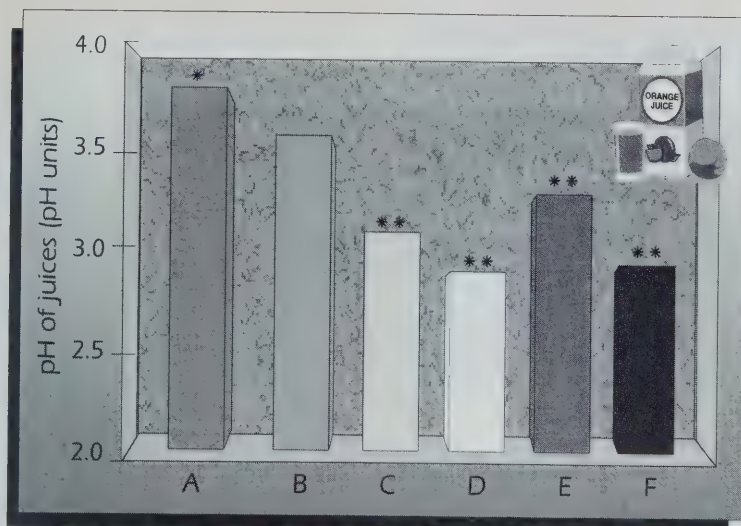


Fig. 1: pH of fruit juices, means of two brands: A = Orange, B = Apple, C = Grape, D = Lemonade, E = Orange Punch, F = Grape Punch

* $p < 0.01$ versus other groups

** $p < 0.01$ versus apple juice.

saliva are supersaturated with respect to hydroxyapatite at normal intra-oral pH. The equilibrium for dissolution of calcium-hydroxyapatite is described by the formula $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2 \rightleftharpoons 10 \text{Ca}^{2+} + 6\text{PO}_4^{3-} + 20\text{H}^+$. If pH falls, PO_4^{3-} ions are converted to HPO_4^{2-} or H_2PO_4^- , and OH^- ions are neutralized to form water. As a result, saliva will no longer be supersaturated, and the reaction will be driven to the right, i.e. it is erosive.¹⁹ The critical pH at which enamel dissolves is about 5.0 to 5.5,^{24,25} but most fruit juices have a pH well below this.^{7,8} Fruit juices have a high intrinsic buffering capacity.^{12-14,26} Consumers who freeze packaged cartons containing fruit juice and later suck the thawed melt are markedly increasing the thawed juice's initial acidity and buffering capacity.²⁶

Recent trends among nursing mothers include bottle-feeding young babies with fruit juice (as a comforter), or freezing the juice and giving babies frozen juice cubes to suck. The long winters in North America, generally, but particularly in Canada, have justifiably produced some concern about sufficient dietary Vitamin C intake. Fruit juices are frequently reconstituted, and are profitably distributed and marketed throughout Canada. Little is known about the buffering capacity or pH of these "Cana-

dian" products. This paper reports on the acidity and buffering capacity of some of the typical fruit juices currently available to Canadian consumers.

Materials and Methods

Two 150 millilitre cartons of 100 per cent pure fruit juice were purchased at different times from local Canadian retail outlets over a six-month period. In all, eight batches consisting of six cartons of each juice were purchased. One sample from each batch was chosen by chance and tested [$n = 8$, from 48

samples for each juice]. The juices studied were orange, apple, grape, lemonade, orange punch and grape punch. No sugar, preservatives or colorants were added, although some of the juices were supplemented with ascorbic acid (vitamin C). The orange, apple, grape and lemon juices contained concentrated juices and water only, whereas the punch contained a mixture of concentrated fruit juices. Two different brands (Minute Maid and McCain) were analyzed.^{27,28} The potable juice was equilibrated to room temperature (25°C) and shaken for 15 seconds. A 100 mL sample of the juice was then placed in a 250 mL beaker and its pH was determined using a single calomel electrode pH meter (Hanna Instruments, Laval Lab Inc., Laval, Quebec). The meter was repeatedly calibrated using calibration buffer solutions (Hanna Instruments) of pH 4.01 $\pm$ 0.01 and pH 7.01 $\pm$ 0.01, at a temperature of 25°C. Each sample's pH was measured three times, and the mean value taken for analysis. The juice was incrementally titrated with 1N NaOH by adding 0.5 mL NaOH to the juice, stirring well and determining the pH. This was repeated until pH 10.

Eight different cartons were assessed this way for each juice. Means $\pm$ standard deviations (SD) were determined for the amounts

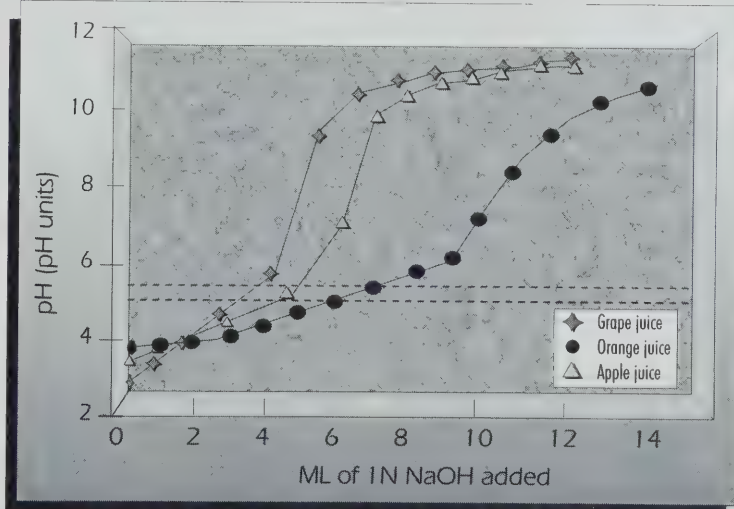


Fig. 2: Titration curves showing the buffering capacity of apple, grape and orange juices: Orange juice required significantly more NaOH to reach pH = 5.0 compared to the other juices ($p < 0.01$) and pH = 11 ($p < 0.001$ — Student-t). All the juices (100 mL of each) absorb at least 3.0 mL of 1N NaOH before reaching the critical pH (5.0 to 5.5) for dissolving enamel. This critical pH zone is indicated by dotted lines.

TABLE I
pH (Means $\pm$ S.D.) Of Two Different Brands of Fruit

Juice Type	Brand 1	Brand 2
Orange	3.82 $\pm$ 0.01	3.86 $\pm$ 0.02
Apple	3.56 $\pm$ 0.02	3.60 $\pm$ 0.02
Grape	3.03 $\pm$ 0.01	3.04 $\pm$ 0.03
Lemonade	-	2.85 $\pm$ 0.02
Orange Punch	3.3 $\pm$ 0.03	3.26 $\pm$ 0.02
Grape Punch	2.90 $\pm$ 0.01	2.86 $\pm$ 0.03

There were no significant differences in pH between the two brands for each juice. Brand 1 = Minute Maid, Brand 2 = McCain

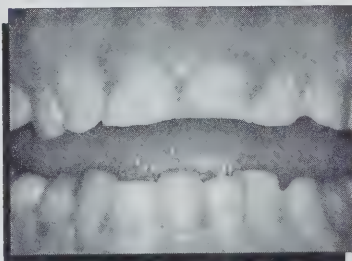


Fig. 3: Erosion caused by fruit juice: The upper incisors are reduced in size due to loss of enamel and dentin. A white "frosted" line of decalcified enamel delineates erosion areas adjacent to the gingiva. This chemical dissolution of tooth substance (erosion) obtains without any influence from bacteria, and there is no cavitation. The buccal and exposed surfaces are smooth, probe hard, and the incisal edges show attrition. The lower incisors are less affected, probably due to protection from the tongue and saliva from the submandibular salivary glands.

of NaOH used at progressive stages of pH. Data are presented as means SD. Comparisons were done using Student T-tests, with $p < 0.05$ considered significant.

Results

The pH of the different juices tested is presented in **Table I** and **Fig. 1**. There were no significant differences in juice pH between the two brands studied. **Fig. 1** shows the pH means of the two brands for each juice. The juice pH varied between pH = 2.85 $\pm$ 0.02 and pH = 3.86 $\pm$ 0.01. Of the juices studied, orange had the highest pH and lemonade had the lowest. The acidity of the apple, grape, lemonade and punch juices was significantly lower ($p < 0.01$) than that of the orange juice, while the lemonade, grape and punch juices had significantly lower pH ($p < 0.01$) as compared to the apple juice. How-

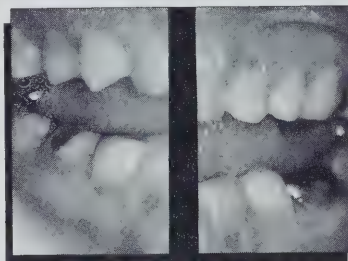


Fig. 4: Erosion and decay caused by fruit juice: The overall size of the teeth, especially the premolars, are reduced, with cuspal blunting. A "frosted" white line of decalcification surrounds shallow, brown buccal cervical areas — these are areas of decay and are soft to probing. Removal of the soft, rubbery dentin would render a cavity, and bacteria are responsible for the *in situ* destruction of decalcified tooth substance. Old restorations appear to bulge up due to loss of adjacent tooth material.

ever, the pH of all these juices was below 5.0, which is the critical pH at which enamel dissolves. Titration curves for apple, orange and grape juices are presented in **Fig. 2**. The amount of 1N NaOH added to the juices to obtain a pH of 11 (the pH at which the curve reaches a plateau) differs significantly ($p < 0.01$) between the orange juice and the other juices. For orange juice, 13 $\pm$ 0.25 mL was added, whereas for apple and grape juice, 6.8 $\pm$ 0.29 mL and 6.4 $\pm$ 0.20 mL were added, respectively. These results demonstrate a significantly higher buffering capacity for orange juice compared to the other juices.

Discussion

The recorded pH and buffering capacities for the juices tested are not dissimilar from those previously reported.^{8,9,13,14,20} These acid characteristics are major, important factors in producing mor-

dant dental morbidity, such as erosion and attrition.^{8,9,25,29}

Mixtures and blends of different fruit juices are common.²⁶ These blends consist mainly of apple, grape, citrus and other flavoring fruit concentrates (such as guava, strawberry, apricot, pear, granadilla, peach or black currant). They generally produce tasty products that remain extremely acid, with high buffering capacities.^{9,26} This high acidity softens the calcified tooth structures.³⁰ Experimental,³¹ epidemiological,²⁵ and clinical^{32,33} reports confirm that dental erosion is causally related to drinking fruit juices.³⁴ Erosion, attrition and decay are found in adults as a result of excess juice drinking (**Figs. 3 and 4**), as well as in children who are regularly fed fruit juices in bottle-comforters, as liquids, or in frozen cubes (**Fig. 5**). The Canadian juices reported on here are representative of the most frequently consumed fruit acids, viz, citric, malic and tartaric. Naturally occurring sugars^{9,10} and natural fruit flavors^{9,26} produce taste-enhancing acidulated blends. Manufacturers may also add extra Vitamin C to these acid mixtures to compensate for the processing loss of the vita-

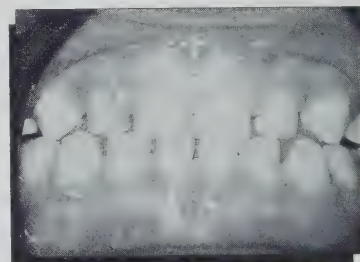


Fig. 5a: Normal deciduous dentition — age 5.

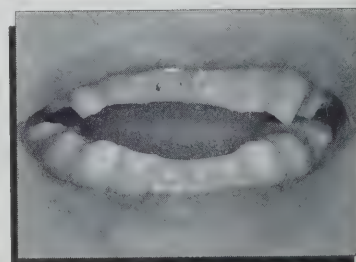


Fig. 5b: Eroded deciduous dentition — age 5. The attrition and erosion affects the upper and lower teeth: this type of erosion results from children sucking commercial fruit juices from bottles, and/or frequent consumption of frozen fruit juice.



Fig. 6: Orange-colored tongue: The dorsum of the tongue is discolored orange or yellow owing to frequent consumption of fruits, fruit juices or iced-fruit confections. An orange tongue in conjunction with erosion strongly suggests acid fruit juice abuse.

min.^{3,6,15} The extra vitamin C (as ascorbic acid) contributes to the acidity and buffering power of the juice.

Increased consumption of fruit juices frequently makes the dentition hypersensitive.^{18,19,35} Although athletes are known to consume large amounts of high-sugar acid drinks (frequently sugar/fructose-sweetened fruit drinks), the erosion seen in this group is related to the pH of the drinks, rather than the amount of sugar the drink contains.^{35,36}

A clinical clue to diagnose patients who consume lots of fruit juice is an orange tongue (Fig. 6) in association with the dental morbidity already mentioned. As a medical supplement, vitamin C, on its own, is known to damage teeth,¹⁶ but many regard commercial fruit juice as being healthy and a "natural" source of the vitamin.

From a dental point of view, consuming large amounts of commercial fruit juice is neither natural nor unreservedly healthy.^{13,14,37} While it is true that many of the commercial fruit juices derived from pure, natural products have no colorants or preservatives added, the degree of enamel erosion initiated by these pure fruit juices would be about five to eight times higher than that of the freshly minced, edible portions of fruit.^{14,38}

Fruit juices are processed, packaged products — they don't grow on trees. In a single sitting, it is unusual for anyone to consume the same amount of whole fresh fruit, in its natural state, as would be required to procure a typical portion of juice. For example, to produce 300 mL of apple juice, eight to 12 apples (depending on size) may be required. In this process, the solids are disregarded (lignin, cellulose, hemicellulose, fibre), and the juice is frequently concentrated to improve flavor.^{8,38} Furthermore, the pH of fruit juice is not the sole factor causing tooth erosion. The amounts, ratios and types of other organic acids and chemical components present in fruit also play a role.³⁸

An intake of fruit juice to provide vitamin C of up to 60 mg (0.34 m/moles) per day could be considered as essential and beneficial.^{3,9,39} However, since malic, citric and tartaric acids are synthesized normally from other food sources by the body, the intake of these acids cannot be considered as essential. Intake of citrus in excess of 150 mL could actually be considered abusive.^{9,37} Although drinking a sweet acidulated drink is accepted as a pleasant experience, clinicians, dieticians and dentists should be aware of the damage fruit juices can do, and also understand how people may become addicted to the stimulating taste⁴⁰ and fall into the temptation of abusive juice drinking. Dietary counselling could include limiting the amount of juice intake, by encouraging patients to: only drink juice through a straw, dilute it with water, reduce their frequency of drinking, or consume it as part of a meal and not as an isolated snack. Patients would also be counselled against sucking frozen juice and drinking juice before sleep. Rinsing the mouth with an alkali mouthwash or toothpaste after an acid drink is advisable. Brushing immediately after a fruit juice drink is not desirable, as softened tooth enamel may be abraded by brushing. With increased awareness by both dentist and patient, the problem of fruit-juice induced dental pathology may be reduced. ■

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Meetings & Announcements

MAY 27th - JUNE 1st 1994 ALBERTA DENTAL ASSOCIATION PROVINCIAL DENTAL MEETING

will be held at the Banff Springs Hotel in Banff, Alberta. For registration or information contact:

Dr. B. Yaholnitsky, 370 - 202 - 6 Avenue S.W., Calgary, Alberta, T2P 2R9 (11/05)

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BERMUDA MEETING

Our annual Bermuda Dental Association Convention will be held at the Hamilton Princess Hotel, Pembroke, on July 4th, 5th and 6th 1994.

GUEST SPEAKER: Linda L. Miles, C.SP., C.M.C.
Dynamic Practice Management

Registration Fee: \$350.00 U.S., includes cocktails, wine and cheese party on arrival night, coffee and refreshments during lectures and cocktails at closing reception.

Hotel accommodations should be made as soon as possible with your local travel agent, or by calling the Hamilton Princess at 1-800-223-1818 in the U.S. or 1-800-268-7176 in Canada.

Send registration and any further inquiries to:

**Dr. Robert E. Gibbons,
"Erin", 2 Southcourt Avenue,
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Fax 1-809-236-8380**

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ONTARIO - Windsor: Denar & Hanau articulator for sale. Call Gabe at (519) 974-6120. (04/06)

NOVA SCOTIA - Halifax: For Sale - Dental EZ J.S.R. chair, A-dec traytrol (chair) MT bracket, Peri-pro developer, BDM1 vibrator, Kodak safe-light, MC #3 cabinet, Dentech 700 control. Contact Dr. Paul Bonazza at (902) 465-4210 or home (902) 466-5484. (02/05)

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at (506) 832-5500. (04/06)

Miscellaneous

ONTARIO - Ottawa: Microscope Wanted - Phase contrast with video monitor. Contact Suzan at (613) 226-2808. (03/05)

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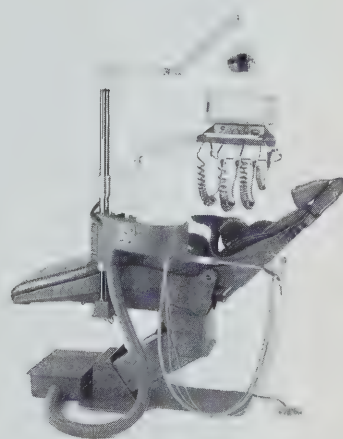
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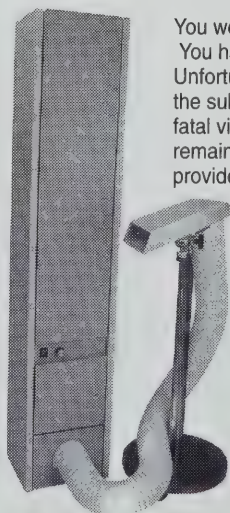
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NATIONAL HIGHLIGHTS

May 26-28, 1994
PEI Dental Association
Annual Meeting
 (902) 566-5199

June 2-4, 1994
College of Dental Surgeons of
Saskatchewan
 Contact: Dr. Bruce Albert
 (306) 693-0755

May 28-June 1, 1994
23e Congrès annuel
de l'Ordre des dentistes
du Québec,
Les journées dentaires
du Québec
 Montréal, Qc
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June 3-4, 1994
Nova Scotia Dental Association
Annual Meeting
 (902) 420-0088

June 10-11, 1994
New Brunswick Dental Society
Annual Meeting
 (506) 452-8575

May 29-June 1, 1994
Alberta Dental Association
Annual Meeting
 Contact: Dr. Kearns
 (403) 253-6602

October 2-8, 1994
Joint CDA/FDI
Annual Dental Meeting
 Vancouver, BC
 (613) 523-1770,
 or 1-800-267-6354

August/Août 1994

August 18-20: Bone Augmentation and Tissue Guidance, two-day implant seminar presented jointly by the Vancouver Implant Seminar (Study Club) and the Canadian Society of Oral Implantology in Vancouver, B.C. For information, contact: Vic, Barry or Linda at (604) 298-4232.

August 18-20: Atlantic Provinces AGD Annual Convention in Brudenell, P.E.I. Speakers: Robin Wright (Interoffice Communications) and Dr. Michael Horsman (Pharmacology Update). For information, contact: Dr. Richard Holden at (902) 566-5133 or Dr. Jack Thompson at (506) 847-4243.

August 24-28: The Canadian Academy of Endodontics — 30th Annual Meeting in Kananaskis, Alberta. For information contact: Dr. K. Fuhrman, Suite 260, Bankers Hall, 315-8th Avenue S.W., Calgary, Alberta T2P 4K1. Tel.: (403) 263-1343.

September/Septembre 1994

September 8-13: 32nd Iranian Annual Dental Association Congress and 12th International Dental Exhibition in Teheran, Iran. For information, contact: A.H. Arfaei, Iranian Dental Association, P.O. Box 14155 - 3695 IR - Teheran, Iran.

September 14-18: 17th Biennial Conference of the New Zealand Dental Association in Christchurch, New Zealand. For information, contact: N.Z.D.A. Biennial Conference Committee, P.O. Box 1183, Christchurch, New Zealand.

September 22-24: Canadian Academy of Restorative Dentistry and Prosthodontics and The Association of Prosthodontists of Canada — Joint Scientific Meeting to be held at the Banff Springs Hotel, Banff, Alberta. For information contact: Dr. Edward W. McIntyre, 164 Meadowlark Shopping Centre, Edmonton, Alberta T5R 5W9. Tel.: (403) 484-1336 or Fax: (403) 489-4930.

September 24-25: 11th International Oral Implant Symposium in Bali, Indonesia. For more information call: (65) 734 3162.

October/Octobre 1994

October 7: Canadian Academy of Pediatric Dentistry in Vancouver, B.C. For information contact: Dr. Ian Bennett, Executive Director, Canadian Academy of Pediatric Dentistry, 4095 Puget Drive, Vancouver, B.C. V6L 2V3. Tel.: (604) 733-7976 or Fax: (604) 733-7996.

October 24-28: Turkish Society of Restorative Dentistry's 2nd International Congress in Istanbul, Turkey. The main topic is "Lasers in dentistry" (Simultaneous interpretation between English and Turkish will be provided). For information, contact: Mete Üçok, University of Istanbul, Faculty of dentistry, 34390 Capa, Istanbul, Turkey.

October 31-November 5: Joint Meeting of the Canadian Society of Forensic Science & Northwest Association of Forensic Scientists at the Waterfront Hotel in Vancouver, B.C. For information, contact: Jeffrey Caughlin, R.C.M.P. Forensic Laboratory, 5201 Heather Street, Vancouver, B.C. V5Z 3L7. Tel.: (604) 264-3507 Fax: (604) 264-3499.

November/Novembre 1994

November 3-5: The Croatian Dental Society and the School of Dentistry, University of Zagreb, are organizing the 1st World's Congress of Croatian Dentists, which is to be held in Zagreb. For information contact: AS - Kongresni Servis, Lastovska 23, 41 000 Zagreb, Croatia. Tel.: 385 41 624 100, 624 101 or Fax: 385 41 624 424.

November 3-5: The American College of Prosthodontics — Annual Session at the Hyatt Regency Hotel, New Orleans, Louisiana. For information, contact The American College of Prosthodontists, tel.: (210) 829-7236.

November 22-25: Congrès de l'Association Dentaire Française in Paris, France. For information, contact: Dr. Alain Deyrolle, 92 Avenue de Wagram, 75017, Paris, Tel.: (1) 42 27 89 00.

November 22-25: XIIIth International Dental Film and Video Festival in Paris, France. For information, contact: Dr. Maurice Dolovici, Secrétaire Général, Association Dentaire Française, 92 avenue de Wagram, F-75017 Paris, France.

February/Février 1995

February 16-18: 25th Annual Miami Winter Meeting in Miami, Florida. For information contact: East Coast District Dental Society, 420 South Dixie Highway, 2-E, Coral Gables, Florida 33146. Tel: (305) 667-3647 or Fax: (305) 665-7059.

March/Mars 1995

March 1-4: Australian & New Zealand Association of Oral and Maxillofacial Surgeons, XVIth Biennial Clinical Conference, Towards 2000: Form & Function, being held at the Park Grand Hotel in Sydney, Australia. For information contact: ANZAOMS Conference 1995, Professional Centre of Australia, Private Bag No 1, Darlinghurst NSW 2010. Tel: 02 331 6920 or Fax: 02 331 7296.

March 18-22: Australian Dental Association, 28th Australian Dental Congress in Hobart, Tasmania. For information contact: 28th Australian Dental Congress, C/O Mures Convention Management, Victoria Dock, Hobart, Tasmania, 7000. Tel: (002) 31 2121 or Fax: (002) 34 4464.

Continuing Education 1994

Thunder Bay Dental Association

July 22-23: Endodontics —
Dr. Herb Schilder

October 22: Oral Pathology —
Dr. Dick Elzay

For information contact:

(Endodontics)
Dr. Don Chorkawy
Tel: (807) 345-0727

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Dr. Wm. E. Turner
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University of Toronto

October 20-21: The Current Treatment and Management of T.M. Disorders.

This program is developed by Dr. George Zarb, professor and head of the prosthodontic department, faculty of dentistry, University of Toronto.

November 24-26: Nitrous Oxide in Dental Practice

This 17-hour course introduces the dentist, and indeed the entire health-care team, to the concept of conscious sedation for the effective and efficient practice of dentistry.

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Frank M. Spear, DDS, MSD

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John A. Kanca III, DDS

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Robert Ibsen, DDS, OD

Six-Handed Dentistry: The Team Approach to Clinical Excellence
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Modern Methods of Restoring Endodontically Treated Teeth
Daniel Nathanson, DMD, MSD

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Gorden J. Christensen, DDS, MSD, PhD

Artistic Interpretations in Porcelain
Lloyd L. Miller, DMD

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Direct Composite Resin: A Viable Restorative for the Posterior Dentition

John A. Kanca III, DDS

Fixed Prosthodontics and Esthetics Advancements in Implant Restoration

Carl E. Misch, DDS

Achievable Excellence in Creative Restorations

Harold M. Shavell, DDS

Solving Tooth Color Problems in Esthetic Dentistry

Ronald E. Goldstein, DDS

Esthetics and the Porcelain Laminate Veneer

David A. Garber, DDS

Predictable and Biologic Cosmetics in Anterior Crowning

Richard D. Wilson, DDS

New Techniques in Cosmetic Dentistry

John A. Kanca III, DDS

Removable Prosthodontics

The (Un)Happy Complete Denture Patient

Glen P. McGivney, DDS

Bar Overdenture Concepts in Edentulous Implant Prosthodontics

Charles E. English, DDS

Osseointegration

Implant Dentistry Live!

Hans Peter Weber, DMD

Surgical Implantology

Joseph E. Canzona, MD, DD

Surgical Placement of Osseointegrated Implants

Mollie A. Winston, DDS

Treating the Implant Patient: Consultation to Completion

Leonard B. Shulman, DMD and Gary S. Rogoff, DDS

Periodontics

The Use of Barrier Membranes For Promoting Bone Formation Around Implants Placed Into Immediate Extraction Sockets

William Becker, DDS, MSD

Periodontal Surgery: From Resection to Regeneration

Raymond A. Yukna, DDS

Advances in Periodontal Surgery

Edward F. Sugarman, DDS and Richard A. Sugarman, DDS

Scaling and Root Planning: A Comparison of Hand and Ultrasonic Techniques

Herbert I. Bader, DDS

Guided Tissue Regeneration II

William Becker, DDS

The Semilunar Coronally Positioned Flap for Esthetics

Dennis P. Tarnow, DDS

New Horizons and Practice Implications in Periodontal Diseases

William J. Killoy, DDS, Tom M. Limoli, DDS, Michael Newman, DDS and Robyn Wright

Periodontal Plastic Surgery: Soft Tissue Grafting for Root Coverage

Preston D. Miller, DDS

TM Disorders and Medical Emergencies

Screening for TM Disorders and the Fabrication of a Chair-Side Occlusal Appliance

Jeffrey P. Okeson, DDS

Medical Emergencies in the Dental Office

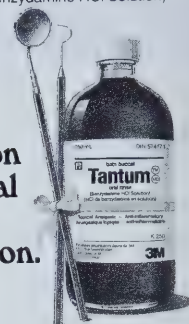
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Animal studies using the parenteral route have shown that "Tantum" Oral Rinse possesses properties of an analgesic—anti-inflammatory agent. This effect is not mediated through the pituitary-adrenal axis. Studies using the topical route have demonstrated the local anesthetic properties of benzidamine hydrochloride. In controlled studies in humans with oral pharyngeal mucositis due to radiation therapy, "Tantum" Oral Rinse provides relief through reduction of pain and edema. Similar studies in patients with acute sore throat demonstrated relief from pain.

Indications

"Tantum" Oral Rinse is indicated for relief of pain in acute sore throat and for the symptomatic relief of oro-pharyngeal mucositis caused by radiation therapy.

Contraindications

"Tantum" Oral Rinse is contraindicated in subjects with a history of hypersensitivity to any of its components.

Precautions

The use of undiluted "Tantum" Oral Rinse may produce local irritation manifested by burning sensation in patients with mucosal defects. If necessary, it may be diluted (1:1) with lukewarm water. Since "Tantum" Oral Rinse is absorbed from the oral mucosa and excreted mostly unchanged in the urine, a possibility of its systemic action has to be considered in patients with renal impairment.

Use in Pregnancy

The safety of benzidamine HCl has not been established in pregnant patients. Risk to benefit ratio should be established if "Tantum" is to be used in these patients.

Use in Children

Safety and dose directions have not been established for children five years of age and younger.

Adverse Reactions

The most frequent adverse reactions reported are: local numbness (9.7%), local burning or stinging sensation (8.2%), nausea and/or vomiting (2.1%). The least frequent were reports of throat irritation, cough, dryness of the mouth associated with thirst, drowsiness and headache.

Treatment of Overdosage

There are no known cases of overdosage with benzidamine HCl gargle. Since no specific antidote for benzidamine is available, cases of excessive ingestion of the liquid should receive supportive symptomatic treatment aimed at rapid elimination of the drug.

Dosage and Administration

Acute sore throat: Gargle with 15 mL every 1 1/2 to 3 hours keeping in contact with the inflamed mucosa for at least 30 seconds. Expel from the mouth after use.

Radiation Mucositis: Use 15 mL as a gargle or rinse repeated 3-4 times a day, keeping in contact with the inflamed mucosa for at least 30 seconds and then expel from the mouth. Begin "Tantum" Oral Rinse the day prior to initial radiation therapy; continue daily during the treatment and after cessation of radiation until the desired improvement is obtained.

Availability

Tantum Oral Rinse is available in 100 and 250 mL bottles. "Tantum" Oral Rinse is a clear yellow-green liquid containing 0.15% benzidamine hydrochloride in a pleasant-tasting aqueous vehicle with 10% ethanol.

Product monograph is available on request.

References:

1. Simard-Savoie S and Forest D. *Curr Ther Res* 1978; 23(6):734-45.
2. Whiteside MW. *Curr Med Res Opin* 1982; 8:188-9.
3. Wethington JF. *Clin Ther* 1985; 7(5):641-6.
4. Product monograph.
5. Yankell SL. Evaluation of benzidamine HCl in patients with aphthous ulcers. *The Compendium of Continuing Education* 1981; 11(1).
6. Epstein JB. *Int J Radiation Oncology Biol Phys* 1989; 16(6):1571-5.

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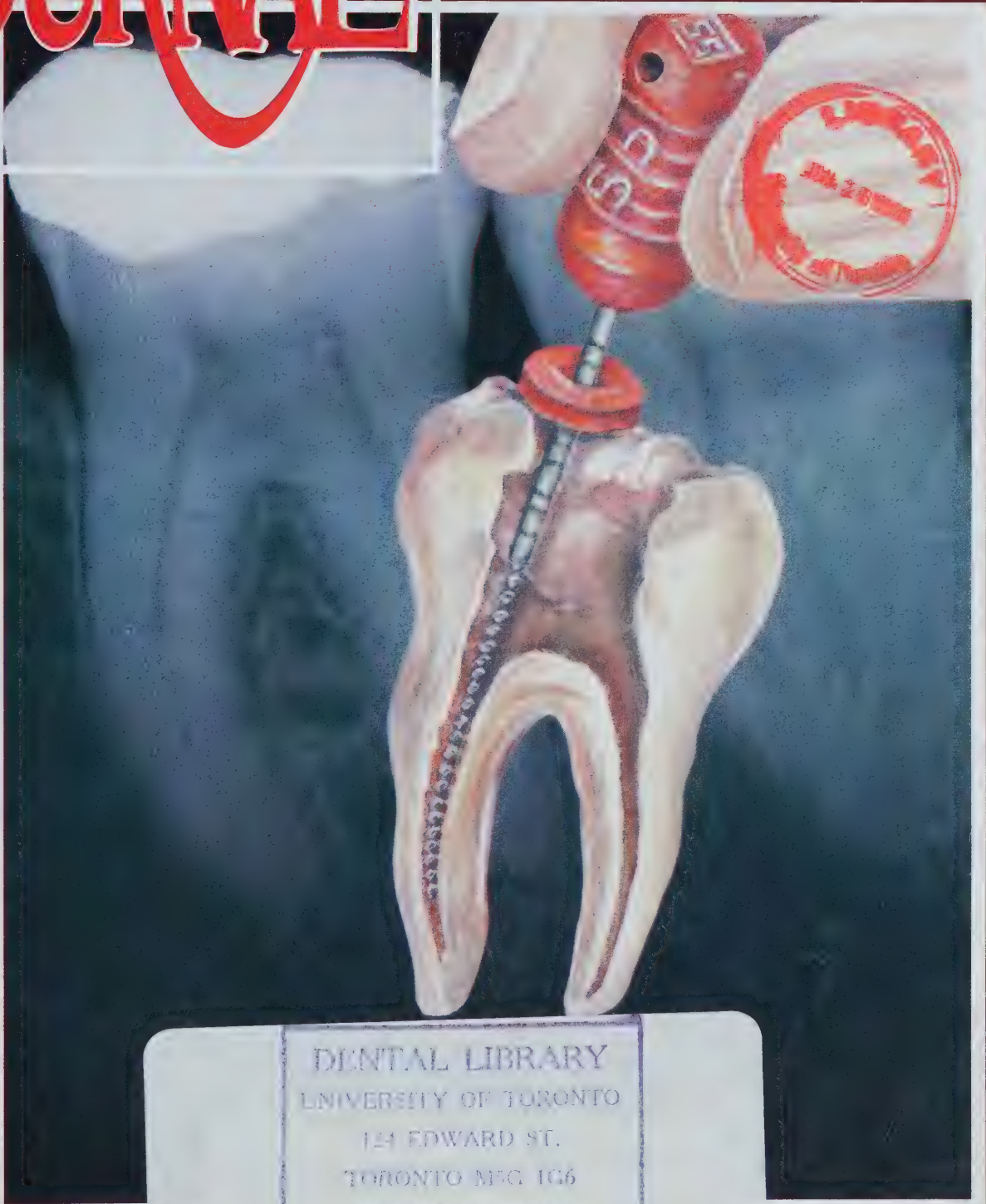
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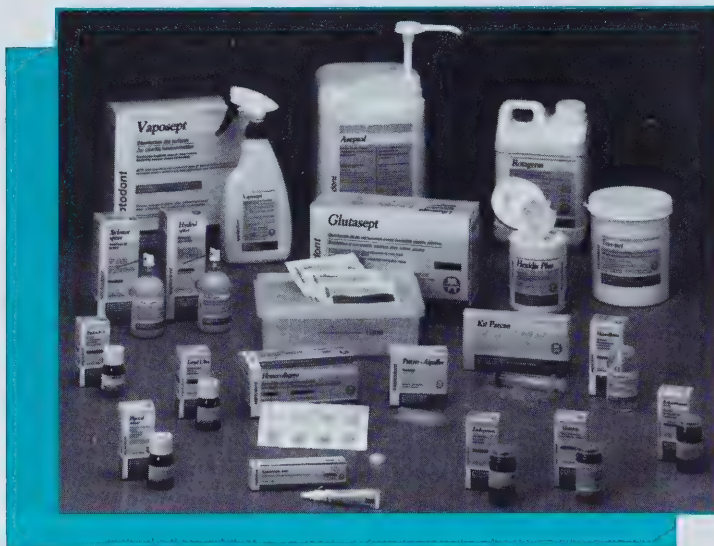
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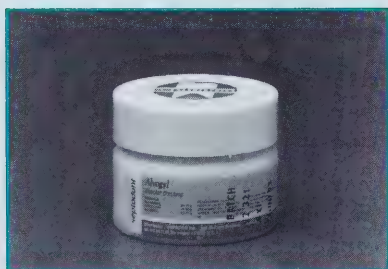
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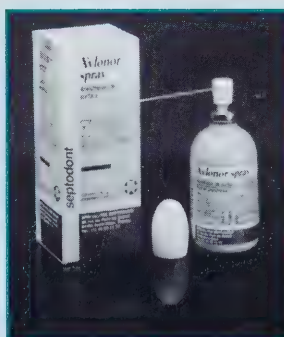
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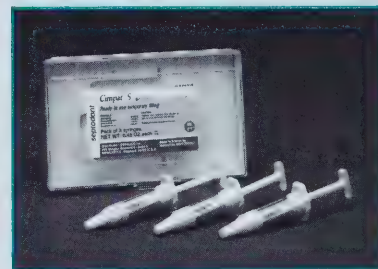
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Published monthly by the Canadian Dental Association at 1815 Alta Vista Drive, Ottawa, Ont. K1G 3Y6. Copyright 1982 by the Canadian Dental Association. Authorized as Second Class Mail, Registration Number 5384. Postage paid at Ottawa, Ont.

Subscriptions: All subscriptions payable in advance in Canadian funds. In Canada - \$48 (+ GST); United States - \$53; all other - \$58.

Subscriptions are for 12 issues, not necessarily conforming with the calendar year.

Notice of change of address should be received before the 10th of the month, to become effective the following month.

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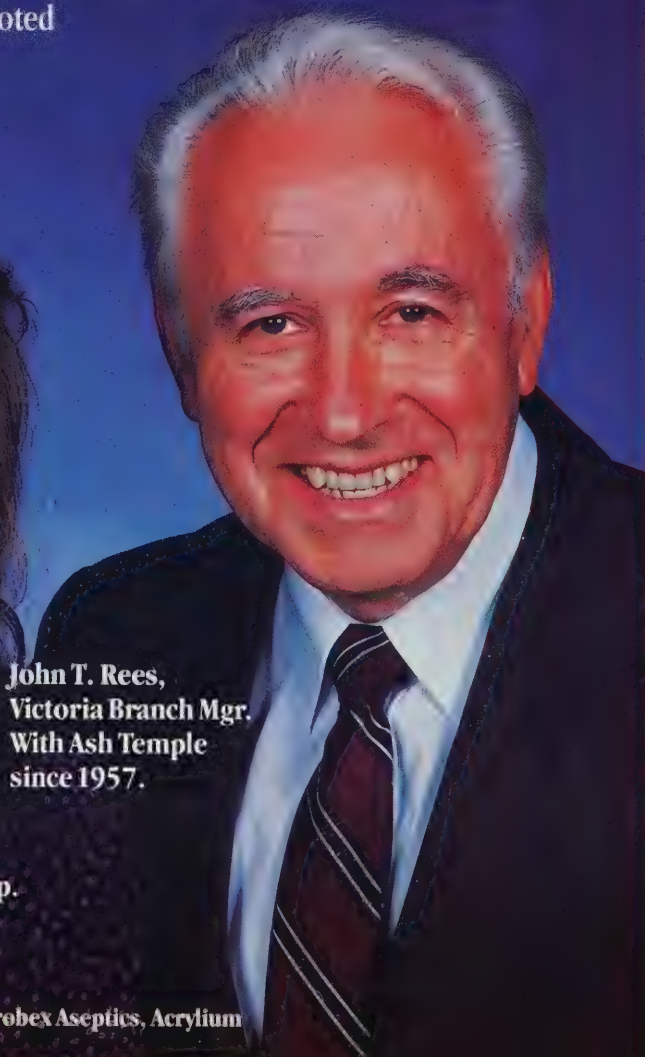
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JUNE/JUIN 1994
VOL. 60, NO. 6

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The *Journal of the Canadian Dental Association* is published in both official languages, except scientific articles, which are published in the language in which they are received. Readers may request the *Journal* in the language of their choice.

ISSN 0709 8936
PRINTED IN CANADA

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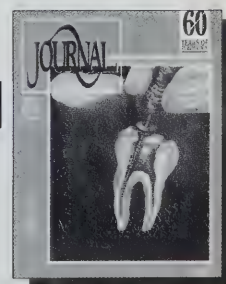
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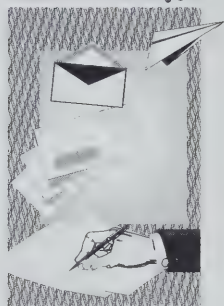
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LETTERS



We Are Not Alone

Recently, returning to Canada from a trip to Finland, I was struck by some ideas while reflecting on my experiences.

I had the honor of being invited to present a continuing education course at the annual meeting of the Finnish Dental Society. I addressed the society for six hours, giving a course on plastic surgery of the face, and emphasizing the principles of wound healing and scarring. In addition, I had the pleasure of speaking to the Finnish Society of Oral and Maxillofacial Surgeons. This group was very keen to hear about interactions between the various specialties that practise head and neck surgery in Canada. I was then given a tour of the facilities of Helsinki University.

Following this, I was flown to the University of Oulu, the northernmost dental school in the world. I was astonished by the facilities. The state of the art nature of both the university hospital and dental school at least parallel any North American institution. I was also invited to lecture in Oulu, but I found myself learning more from my audience than they did from me.

This was not that surprising to me. After all, the dental revolution of the last two decades — the clinical introduction of osseointegrated implants — came from Sweden.

I have spent several years training in Europe, at different places and during different windows of history. My impression in 1980 was that North America was certainly ahead of Europe in certain areas of my

surgical specialties. Twelve years later, in 1992, I was amazed to find that France and Switzerland had surpassed our standard of care.

Finland, in 1994, was certainly no different. With the Marshall Plan long forgotten, Europe has advanced. My visit occurred during an important juncture in Finland's history. The question of amalgamation into the European Economic Community was upon the country. One of the main issues is the standardization of professional education throughout Europe.

However, like Canada, Finland has been hard hit by the global recession. As the Canadian dollar has slid down the money trading scale, the Finnish Mark has been devalued. As in Canada, unemployment is at record levels — in Finland it is 20 per cent.

Finland has a surplus of dental manpower. For a country of five million, it has four modern dental schools. At least it had four schools. Faced with the reality of diminishing resources, the sad task of deciding which one of the four schools should close had begun. With the usual wisdom that seems common to bureaucrats, the current government has chosen to close not one, but two schools. "It is easier to close two dental schools at once than one school alone," I was told.

I thought of back home. The North American buzz words of the past two years, in our own country, have been downsizing, restructuring and rationalization. It would be dangerous if these words were confused with simple indiscriminate slash and cutting of the valuable health care programs that our country seemed so proud of in the past.

Like Finland, we in Canada are facing the pinch of shrinking economic resources. And like the Finnish, we must take part in this debate. Our ethical responsibility dictates that we must make sure, as patient care advocates, that we position ourselves to be able to give the best care we can possibly offer. That includes the best treatment, standard of care and most of all, for the years to come, the best education of our future professionals that can be pro-

vided. That was my most significant lesson in Finland.

George K.B. Sandor, MD, DDS, FRCD(C), FRCS(C)
Consulting Editor in Medicine
Journal of the Canadian Dental Association

Bombay Requests Educational Material

We are a non-profit organization of healthcare professionals whose primary service is the provision of free clinical care for poor patients from the slums.

In order to improve the care we provide to our patients, we have a patient education library — India's first, as described in the World Health Organization journal, *WHO Forum*. One of our priorities is patient and health education, since we firmly believe that the best patients are well-informed patients, who can take care of their own health. While we have a nucleus of educational materials, we are still short of patient educational materials and appeal for help.

Perhaps your members in Canada who have spare copies of suitable patient educational materials could send them on to us. Even shop-soiled or damaged, older editions would be welcome to help us stretch our very limited budget.

The books and materials can be sent via the International Book Project, 1440 Delaware Avenue, Lexington, Kentucky 40505.

A.N. Malpani, MD
Medical Director, Community Health Research Program
Ashish, Tardo, Bombay, India
400 034

Dental Implants

I wish to add to the comments of Dr. George K. Scott (In: Editor's Note. Letters To the Editor, *J Can Dent Assoc* 60:264, 1994), which followed Dr. McJannet's letter on the cost of implants. While Dr. McJannet has taken a "white knight" attitude on behalf of dental patients, re dental fees, it should be stated, again, that many dentists are placing



and/or constructing prostheses for implants with no special training, or, at best, a weekend course sponsored by a dental implant manufacturer.

If the success rate of these procedures is to continue improving, there must be standardization of training as a prerequisite for those dentists who choose to practice this aspect of our profession.

Hershel Bernstein, B.Sc., DDS
Pointe Claire, Quebec.

DID YOU KNOW?

Vaseline

In 1857 a Brooklyn, New York, chemist named Robert Chesebrough visited the site of the first oil strike in United States history in Titusville, Pennsylvania. The oil workers he talked with kept mentioning "rod wax" — a substance that collected on oil pumping machinery. They claimed it healed their cuts and burns.

Robert Chesebrough took a sample of the "wax" home to study and worked on refining it into a jelly-like product. He deliberately cut and burned himself and rubbed the Vaseline (a combination of the German word for water, vasser, and the Greek word for oil, elaion) on his wounds. He found that it did actually speed up the healing process.

In 1870 he set up a factory and started mailing samples to physicians and scientists around the country. They ignored him. He then went public. Loading his wagon with jars of Vaseline he rode around New York state handing them out to everyone. Soon people were taking their empty sample jars to their local druggists to order refills, and Chesebrough's business was launched. By 1912 Vaseline and its healing qualities was being written up in medical journals.



ABSTRACT

Diagnosis of Vertical Root Fractures

Vertical root fractures can be very difficult to diagnose due to the variability of symptoms and lack of visual and radiographic evidence upon examination. The symptoms of vertical root fracture can often mimic endodontic symptoms and endodontic failure in root treated teeth. The misdiagnosis of root fracture can result in unsuccessful endodontic therapy, continued symptoms and significant infection. Endodontically treated teeth are more susceptible to root fracture particularly if the tooth has not been adequately restored after root canal therapy has been completed.

The diagnostic features of vertical root fracture as well as a report of a case are detailed in this article.

The early symptoms of vertical root fracture are usually minor and some cases are totally asymptomatic. The most common complaint is discomfort or pain on pressure or percussion that does not resolve with time, and thermal sensitivity may or may not be present. The symptoms of a root fracture are most often caused by the involvement of the pulp in fractured vital teeth and the involvement of the periodontal ligament in non-vital teeth.

The appearance of radiographic evidence of root fracture is often quite late and usually consists of periapical or midradicular radiolucency. The actual root fracture is difficult to visualize radiographically unless the fracture is parallel to the X-ray beam. Symptoms of vertical root fractures progress to periodontal breakdown, sinus tract formation, soft tissue inflammation and frank abscess formation.

Once a root fracture is suspected, selective biting pressure, periodontal probing, dye tests and transillumination as well as radiographic examination can be used to assist in diagnosis. Definitive diagnosis is dependent upon exploration by the removal of the existing restoration or crown or by surgical exposure of the affected area. Fractured roots usually result in the loss of single multi-rooted teeth. The presence of extensive bone loss or infection requires extraction of the tooth to correct.

The majority of root fractures extend from one root surface to the other and involve the root canal. Incomplete root fractures do occur and pulpal involvement is not always associated with a vertical fracture. The presence of vertical root fracture in a tooth generally indicates a poor diagnosis.

Root fractures can be the result of incomplete or inadequate restorative support for a tooth or due to iatrogenic trauma. Over-instrumentation of the root canal space during endodontic preparation by files and Gate-Glidden drills can render a tooth susceptible to fracture. The preparation of a post space that does not leave sufficient root structure in place will also predispose to vertical root fracture. The use of excessive force during lateral condensation of gutta percha during endodontic obturation and the type of endodontic dowel used contribute to the fracture susceptibility of a tooth.

The occurrence of vertical root fracture although not entirely preventable can be reduced by adherence to basic restorative principles concerning post placement, the restoration of endodontically treated teeth and the minimization of occlusal trauma.

(E.V.F. Fachin, *Quint. Int.*, 1993; 24:497-500)

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JOURNAL

June/
June
1994
Vol. 60
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GUEST EDITORIAL

INQUIRY PROCESS: A HIGHER LEVEL OF RESPONSIBILITY



Dr. Ron Markey

Nothing is more intimidating or threatening to members of the dental profession than to be subjected to the peer review process as a result of a formal complaint made to their licensing authority.

This fear escalates considerably when our peers recommend that, due to the nature of the complaint(s), a formal hearing, or court of inquiry, should be held to deal with the matter in an appropriate way. Whether the issue involves quality of care, ethics, fraud or abuse, the profession must now exercise its responsibility in a manner that demonstrates to its members, the public and government, that our right to self regulation is in the best interest of all, and not just the profession.

Stated another way, with the increase in public and government scrutiny of the self-regulating professions, including dentistry, it is imperative that the very highest standards are adhered to in the administration of our internal judicial proceedings. We owe it to the public, we owe it to the government, and we also owe it to the individual whose conduct is under review and whose professional reputation and livelihood is at stake.

Each licensing body in Canada has strict guidelines that it follows in

the peer review process. Legal counsel are involved, as needed, on behalf of all parties. In addition, inquiry panels have the benefit of a legal consultant to assist them with decisions that must be made during the hearings, when reviewing evidence, and when attempting to draft decisions. This is the process that is followed in my own province of British Columbia, and all other jurisdictions have similar protocols.

We have made some adjustments to the process in B.C., all of which are designed to maximize the ability of panels to render decisions that are, above all, fair.

It is not easy to be called on to sit in judgement of a colleague. Licensing body hearings are quasi-judicial in nature, and carry a lot of weight. However, their decisions are often appealed to a higher court, and the quality of the inquiry process must be above reproach. This takes training and experience. In B.C., a number of dentists and allied dental personnel are appointed, for long terms, to a standing inquiry committee. A government public representative and other lay representatives are also appointed to the committee.

In my province, the chairman of the committee, in concert with the registrar's office, appoints the chairperson and members of an inquiry panel, as needed, from the committee's membership. Usually three or four members are appointed to the panel, including one public representative.

It is anticipated that inquiry committee members will possess a range of expertise and experience. In addition, however, on two occasions B.C. has held training sessions to update and inform committee members on recent inquiry proceedings, as well as on decisions and penalties in our jurisdiction and elsewhere. These issues were discussed and debated with the full committee, the B.C. college's legal advisors, and the independent legal advisor retained

to work with the inquiry panel. A retired justice of the B.C. Supreme Court also attended the training sessions, to provide general advice and counsel with regard to "judging."

The outcome of this process, while not perfect, adds to the comfort level of those who have to sit in judgement. It also enables us to identify those individuals who have the desire or ability to chair inquiry panel proceedings — something not everyone is comfortable with. It is our intention to conduct similar training sessions to update our committee, as needed, in particular when there have been changes to the committee membership, or new legislation or judgements that effect our procedures.

We have to face the age old criteria of not only being fair, but of being seen to be fair by all interested and involved parties. Self regulation is a precious gift worth preserving. We believe it really is in the best interest of the public as well as the profession. But no judicial or quasi-judicial process can be perfect at all times. We owe it to the public and to the profession to bring the maximum level of expertise possible to our efforts to reach fair and impartial decisions. If any one of us were involved, would we want to settle for less?

Ron Markey, DDS, MSD, is a past-president of CDA and of the College of Dental Surgeons of B.C. He is currently Chairperson of the Inquiry Committee of the B.C. College of Dental Surgeons and maintains a private orthodontic practice in Vancouver and Richmond, B.C.

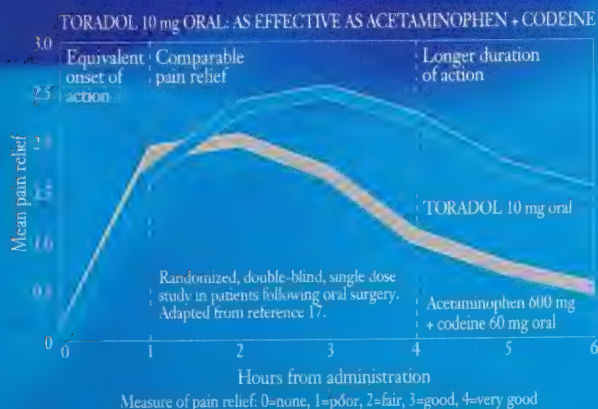
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EDITORIAL

THE PATIENT'S NEED TO KNOW



Dr. P. Ralph Crawford,
Editor

A day seldom passes without a member of the public calling the Canadian Dental Association's Ottawa headquarters about some aspect of dental treatment. To many people, it is no doubt a very natural thing to do. After all, for almost 100 years, CDA has prided itself on being the "voice of dentistry" in Canada.

In most instances, the calls are easily handled by CDA's information officer. Inquiries on such things as mercury, fluoride application, sealants, denture relines, root canal procedures, implants, etc., are all treated the same way, depending on their complexity. Where possible, a simple answer or explanation is provided to the caller over the telephone. In some cases, additional information is sent out to the caller in the mail. And without fail, the caller is advised to seek the advice of a dentist.

There are times, though, when a caller's request would tax the wisdom of Solomon, and no easy explanation or answer is available. CDA is not a licensing authority. It is not in the business of advising one course of treatment over another, recommending one dentist over another, or judging the quality of care that a caller received.

However, the need of the patient to know is an important issue, and it's one that every dentist should be aware of. Informed consent has become a major concern in the United States, and it is likely to become increasingly important in Canada in the near future.

But how much should a patient be told prior to dental procedures, and what should that patient be told if the treatment provided subsequently fails?

Take, for example, the patient who called CDA about her endodontic treatment. In the course of negotiating a canal, the dentist created a perforation. The dentist explained the perforation to the patient, and advised her to inform the restoring dentist about it when she had her crown constructed. Unfortunately, for a variety of reasons, repair of the perforation was not possible. The tooth was lost and replaced with a three-unit bridge. The patient's questions were pretty basic. "Does the dentist who created the perforation have to refund my money, and should I have to pay the \$1,500 for a bridge that I didn't need in the first place?"

Another patient called to say that he had had a crown placed on a molar, and within six weeks the tooth required root canal treatment. Again, difficult questions were posed. "Why did I need a root canal? Who pays for the root canal? And now that the crown has to be replaced, who pays for it?"

How do you respond to an anxious mother who calls to say that a dentist, in the process of examining her child, came out into the reception area to ask if it was alright to apply sealants. Probably without thinking about either the cost implications or the actual need for the procedure, the mother said yes. Later that evening, however, she was unable to respond to her irate husband, who was apparently as concerned about the whys and hows of sealants as he was about the dentist's \$90 fee.

The growing field of implants offers its own intricate questions. One patient called about the "many thousands" he had spent two years ago

on six implants and a full lower denture. It seems that two of the implants have been lost and the prosthesis is now being borne by the remaining four.

"Why did two of the implants fail?" he asks. "Why should I pay for having them removed and adjusting the denture. How long will the others stay in place?"

While CDA's information officer deals with each of these cases on its own merit, she often has few options other than to explain emphatically that CDA is neither a mediator nor a peer review committee. In cases involving standards of care or fees, callers are referred to the proper provincial organization.

But calls like these identify just how important effective communication between dentists and their patients really is — communication beyond the cold legal realities of informed consent. In all likelihood, many callers do not fully understand the technicalities of informed consent, but most are really concerned about being treated with understanding, kindness and fairness.

The issue seems to boil down to what the dean emeritus of Canadian registrars, Dr. Kenneth Pownall, says, "Inform before you perform." Or, as stated in the Ontario Dental Association's fee guide: "Too often the results of dental treatment do not depend upon the operator's ability, as much as on how conscientiously the patient is treated."

In his May 1994 editorial, Dr. Richard J. Simonsen, editor-in-chief of *Quintessence International*, puts much of the difficulty of the patient's need to know in perspective: "Every dental office should have a risk-protection strategy closely tied to the ethical obligation of informed consent. In a nutshell, a risk-protection strategy would consist of telling the patient: Here's what I can do. Here's what could happen. Do you have any questions?"

P. Ralph Crawford, BA, DMD
Editor of the *Journal of the Canadian Dental Association*

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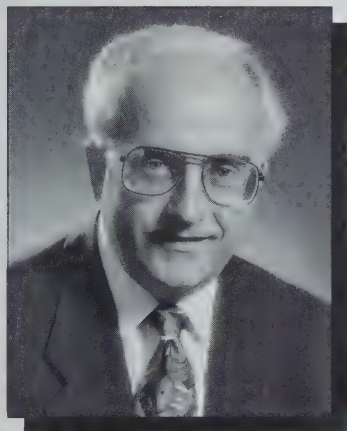
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PRESIDENT'S COLUMN

THIRD-PARTY PAYMENT PLANS ENDANGERED?



Dr. Raymond Wenn
President of CDA

Most people wouldn't associate the Florida manatee with third-party dental insurance plans. After all, it's difficult to imagine that there could be any connection between the manatee, a large aquatic mammal found in the rivers and estuaries of southern Florida, and third-party payment plans, the current system of ensuring that the majority of working Canadians and their families have access to optimum oral health care. But as I discovered during a recent visit to Sea World with my family, the Florida manatee and third-party payment plans may actually have a lot in common, at least in terms of their future survival.

In fact, there are less than 2,000 surviving manatees. This unique creature is on the endangered species list because mankind has polluted and destroyed much of its natural habitat, while continuing to maim and kill the survivors on the propellers of both pleasure and commercial watercraft. And unless the slaughter stops, the Florida manatee is probably doomed to extinction. The 2,000 still alive today may be the last generation.

Now consider the future of employer-paid third-party dental benefit plans. Are third-party payment plans doomed to become the manatee of Canadian dental insurance? Are we

poised to destruct the environment that sustains these plans, putting their long-term survival in jeopardy? Will government, either at the provincial or federal level, ultimately kill third-party plans via the propellers of taxation? Will employers slowly eliminate them in the name of cost containment?

Dental insurance plans gained a firm foothold in Canadian society in the early '70s, largely as the result of the anti-inflation wage and price freeze policies adopted by the federal government. These policies encouraged employers to curtail wage increases, with the result that many unions ultimately agreed to contract settlements that provided members with employee benefit packages, many of which included dental insurance, rather than cash in their pockets.

This rapid surge in benefit plan coverage ended in the early '80s, but a pattern of slower growth continued throughout the decade and into the early '90s. The peak was reached in 1992, when 70 per cent of all Canadians were covered by some form of dental insurance plan. However, with the rise in unemployment brought about by the recent recession, and today's jobless economic recovery, the number of Canadians covered by third-party payment plans has begun to decrease.

More importantly, increased competition in the marketplace has left many employers searching for ways to decrease their per-unit labor costs. This has led to a re-evaluation of all employee benefit plans, including dental insurance packages.

Employers are now focusing on a new generation of plans, euphemistically called managed health care plans, that are designed to manage the cost of providing coverage, not the dental health of individual employees. Insurers are meeting this "need" by designing plans with limited coverage and high deductibles. In other words, under managed health care plans, the cost of dental care will shift back to the individual employee and away from the employer.

These new plans will be closer to "true" dental insurance, in that they will protect individuals against high costs, but not cover such things as regular maintenance and restoration. For example, plans may carry deductibles of \$225 for singles and \$450 for families,

so that only 20 per cent of all claims will be eligible for reimbursement, while 80 per cent will fall below the deductible limit.

This concept has serious implications for the dental profession. It is well known that people with little or no dental coverage visit the dentist less often than those who have adequate coverage. And if Canadians choose to delay diagnostic and preventative services, for whatever reason, their oral health will suffer.

The second threat to dental benefit plans is that the federal government is likely to put the whole question of taxing employer-paid dental insurance premiums back on the table this fall. Initial projections indicate that the government could raise up to \$1 billion by taxing these premiums, while increasing the tax burden of the average Canadian family by as much as \$500 to \$1,000 per year.

If this happens, many Canadians would simply opt out of employer-paid dental benefit plans. This has already happened in Quebec, which implemented a similar tax in mid 1993.

With employers set to cut back on employee benefit packages, and the federal government latching on to employer-paid dental insurance premiums as a possible "cash cow," the future of oral health care in Canada has reached a critical juncture. The dental profession must recognize this dual threat to third-party payment plans. If we don't get our message across, to both our patients and to government, third-party dental insurance plans as we know them are likely to join the manatee on the endangered species list, and may even be doomed to extinction. Let's ensure that today's plans are not the last generation.

To that end, CDA has initiated a full-scale public awareness campaign to keep member dentists and their patients informed about the dental benefits premium tax issue, and to ensure that they are fully aware of the consequences of such a tax. Your support, and the support of your patients, will be crucial to the ultimate fate of third party dental insurance plans in Canada.
*Raymond Wenn, DDS
President of the Canadian Dental Association*



June/
Juin
1994
Vol. 60
No. 6

JUNE, 1935

DENTISTRY — AND SOMETHING ELSE

by *Harry S. Thomson, DMD*

“**T**o do one thing well is to be distinguished; to do more than one thing well is to be a genius.”

You wouldn't think that a circus coming to town could make such a difference, but it did. It entirely changed one boy's life plan. He was going to be a circus performer, a tight-rope walker, the best tight-rope walker the world had ever seen. He wasn't going to carry a balance pole; nor was he only going to walk — he was going to dance on a rope.

At last the circus day arrived. For weeks the boys had been entranced with the posters, showing the celebrated family of equestrians, the beautiful girl on the flying trapeze, the biggest hippopotamus in captivity, and the hundred-and-one other attractions that circus posters shout aloud. Of course, all the boys could not afford to go to the circus, particularly the gang of which our future tight-rope walker was a member, but there was one consolation. The posters said there would be a grand open-air concert — free — on the circus grounds, immediately after the big parade, at which Pippo, the Italian light-weight tight-rope walker, was going to perform.

The free show was on, and every member of the gang was there — eyes staring, mouths open. Pippo was a little disappointing; he did not dance, and he carried a balance pole. He seemed to be having a little difficulty, and did not do anything wonderful at all — so said our hero, the future circus performer. When the show was over a decision was made that all of those who could not go to the big show would hold a circus in the barn at home, and the chief attraction would be a real tight-rope walker without a balance pole.

Two-thirty, and once again “the show was on.” They did not have a rope, so had to borrow one from Mrs. Trudeau next door. The rope was stretched from the barn to a neighboring tree. Our hero ascended and stepped out on the rope without a balance pole. The gang cheered as he was half way to the tree. He was doing better than Pippo — much better — when suddenly



Dr. Joseph Nolin

the rope broke and the boy fell to the ground in a heap.

The doctor said he would have to stay in bed for months with a plaster cast on his leg and hip, for the hip was broken. The gang came in laden with sorrow and books. (It was the books that made the difference.)

So that is how the circus changed one boy's entire life plan. Fate had decided that he was not to be a circus performer, but a dentist, one of the most outstanding dentists in all Canada, and later to become vice-dean of the dental faculty of the University of Montreal. Last year he was tendered a banquet by his university and professional confrères on his fiftieth anniversary in dentistry.

During those weeks in bed the boy found out that there were many other things he could do. He discovered that he could draw and paint, and some of his pictures have been hung in Canadian art exhibits. He also discovered that he was a poet, and two of his books of poems have been published.

This is the early story of Dr. Joseph Nolin, professor of preventive dentistry, professor of

operative dentistry, and vice-dean of the dental faculty, University of Montreal, whose photograph appears as the frontispiece in this issue of the *Journal*. Early in his professional career, Dr. Nolin was inspired with a vision of what preventive dentistry meant to the general public, and to this end he has devoted a great part of his life.

In 1927 he was appointed by the college board as a member of a commission to make a study of public dental health throughout the world. On this mission he visited all the dental educational centres in the United States and Canada, and submitted a comprehensive report to the Quebec government covering details of the activities along public dental health lines in the various centres, and made suggestions for a concrete program for his province.

Dr. Nolin is a past-president of the Canadian Dental Association (1916-1918), and is also president of the Hygiene Committee of the Montreal Catholic School Board. He is a member of the Board of Education of the city of Montreal, and in that capacity has been responsible for the inauguration of a milk distribution to undernourished children in the schools.

Dr. Nolin, in early life, became a great admirer of Dickens, both the man and his work, and has lectured to many audiences in Canada and the United States on Dickens and his contemporaries.

Dr. Joseph Nolin was born in St. Johns, Quebec, and attended Ottawa University, Laval University Montreal, Philadelphia College of Dentistry and the New York College of Dentistry. He was one of the founders of the dental faculty of Laval University, Montreal Branch, which later became the University of Montreal, and occupied the chair of operative dentistry and bridge work.

In 1892, Dr. Nolin married Luciana Boucher, and has four children, two sons and two daughters. One daughter inherited her father's artistic ability and has achieved success as a sculptress.

Dentistry can well be proud of Dr. Nolin and his achievements. He is an artist, a poet, and a *littérateur*. He is also an outstanding public speaker. The government of France has conferred on him the honor of making him an "Officier de l'Instruction Publique de France." He is a citizen and a dentist of more than usual ability, who is loved and revered by his confrères throughout all of Canada.

"Little minds are tamed and subdued by misfortunes; but great minds rise above them."

— *Washington Irving*

Testament

Friends, if I were to die
Before my work is done
Or to sink before I reach
The haven I seek without respite;
If till the final dawn
Of the inextinguishable light
I were to close my eyes
Without seeing my vision fulfilled;
For having not vanquished,
For having lost the battle,
Do not fear that I will go
With a heart full of bitterness;
No, I shall have no regrets
For having done so humble a deed
Or for having done so little good.
I've done some good – the rest is nothing!
I've done some good every time I could,
Thanks to God, and I leave it to Him
To take me with Him even if my task
Isn't over – it's His business.
For I count myself fortunate
(I say so in a hushed voice)
To be just someone unknown
Who is passing by.

— *Joseph Nolin*

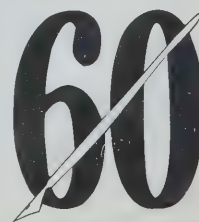
Diamond Jubilee of Publication

Throughout 1994, the *Journal of the Canadian Dental Association* celebrates 60 years of publication as the authoritative "voice" of dentistry in Canada. Each month, in commemoration of its Diamond Jubilee, the *Journal* will reprint an article from Vol. 1, 1935.

This month, the *Journal* looks back on the life and times of Dr. Joseph Nolin, one of Canada's dental pioneers. Born in 1863 in Saint-Jean d'Iberville, Québec, Dr. Nolin earned his DDS at the Philadelphia College of Dentistry in the late

1800s. Returning to Canada, he established a practice in Sorel, Quebec, but moved to Montreal in about 1899.

In Montreal, Dr. Nolin served two terms as president of the Quebec College of Dental Surgeons, before becoming CDA president in 1916. Dr. Nolin was also active in teaching, and in 1943 he was named professor emeritus by the University of Montreal's dental faculty. The following year, the university awarded him a doctor of dental surgery degree "Honoris Causa".



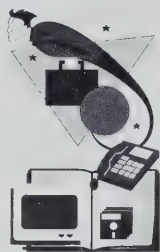
CDA LIBRARY

Tooth Luxation

The topic for this month's library package is tooth luxation. Copies of the package are available to members of the Canadian Dental Association for \$5, and can be ordered by contacting the library. A complete list of all available packages will be provided upon request.

A selection of the articles contained in the June library package is provided below:

1. Von Arx, T. "Developmental disturbances of permanent teeth following trauma to the primary dentition." *Australian Dental Journal* 38(1): 1993.
2. Bhambhani, S.M. "Treatment and prognosis of avulsed teeth. A discussion and case report." *Oral Surgery,*



Oral Medicine, Oral Pathology 75(2): 1993.

3. Belanger, G. and Kluender, R.L. "More about avulsed primary teeth." *JADA* 123(12): 1992.

4. Krasner, P. and Person, P. "Preserving avulsed teeth for replantation." *JADA* 123(11): 1992.

5. Darendeliler-Kaba, A. and others. "Teenage luxation injury: report of a case." *Journal of Dentistry for Children* 59(4): 1992.

6. Newton, C.W. "Trauma involving the dentition and supporting tissues." *Current Opinion in Dentistry* 2: 1992.

7. Mentz, D.D. and Rollefson, J.H. "Avulsion of a maxillary primary first molar in a 19-month-old child." *Pediatric Dentistry* 15(1): 1993.

New Acquisitions

The following books have been added to the library collection and can be borrowed for a shipping fee of \$5 (which includes return postage).

1. Miller, C.H. and Palenik, C.J. *Infection control and management of hazardous materials for the dental team.* Mosby : 1994, 291 pages.

2. Jong, Anthony, W., editor. *Community dental health.* Mosby : 3rd edition, 1993, 347 pages.

3. Sapienza, Frank J. *Computers in the dental office.* Mare Pub. : 1992, 76 pages.

4. Krenkel, C. *Biomechanics and osteosynthesis of condylar neck fractures of the mandible.* Quintessence : 1994, 167 pages.

5. Little, James W. and Falace, Donald A. *Dental management of the medically compromised patient.* Mosby : 4th edition, 1993, 590 pages.

6. Dale, Barry, G. and Aschheim, Kenneth, W. *Esthetic dentistry.* Lea & Febiger : 1993, 510 pages.

7. Jordan, Ronald, E. *Esthetic composite bonding.* Mosby : 2nd edition, 1993, 371 pages.

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NEWS UPDATE



Dr. George Citrome

Ottawa Dentist Elected President of RCDS

Dr. George Citrome, an Ottawa endodontist, was elected president of the Royal College of Dental Surgeons of Ontario (RCDS) March 25 during the 321st meeting of the RCDS council.

The RCDS council first met in 1868, when the newly constituted college represented 60 practising dentists. Today RCDS serves as the licensing body for over 6,200 dentists.

Dr. Citrome graduated from McGill University as a doctor of dental surgery in 1972, and received his master of science and a diploma in endodontics from Chicago's Northwestern University in 1977. Prior to running for the RCDS, Dr. Citrome served as president of the Ottawa Dental Society and as a governor of the Ontario Dental Association. He has served two previous terms on the RCDS council. During his last term, Dr. Citrome also served as a member of the RCDS executive committee, chair of the registration and general purpose committee, and as a member of the legal and legislation committee. ■

CIDA Funding Available For Graduate Training

Up to \$20,000 in funding is available to Canadian organizations providing an opportunity for recent university graduates to acquire skills

and experience in international development.

Organizations with an international development component may now apply to the Canadian International Development Agency (CIDA)'s Overseas Development Associates Program for a grant to train a recent graduate student.

Further information on the program may be obtained by contacting the ODAP Coordinator, Bureau for International Cooperation, University of Ottawa, 550 Cumberland Street, Room 155, Ottawa, Ontario K1N 6N5. ■

Dean Barry Sessle Awarded 1994 Pindborg Prize

Dr. Barry Sessle, a professor in the department of physiology and the dean of the University of Toronto's dental faculty, was awarded the 1994 J.J. Pindborg Prize April 11 during a special ceremony at the Panum Institute in Copenhagen, Denmark.

The prestigious award recognized Dean Sessle for his outstanding research into the neurophysiology of motor performance in the orofacial region and the sensory

mechanisms of the trigeminal nerve related to orofacial pain.

Valued at 50,000 Danish Krone (approximately \$11,000 Cdn), and awarded every two years, the J.J. Pindborg Prize was established by Munksgaard International Publishers in 1992 to mark the 70th birthday of Professor Pindborg, one of international dentistry's major figures.

Professor Pindborg had an immense influence in the school of dentistry, Copenhagen, from 1946 to 1991. ■

Calling all Eastman Dental Institute Alumni

The Eastman Dental Institute — formerly called the Institute of Dental Surgery — in London, England, is establishing an alumni association. All former staff and students are requested to contact Sue Spencely, Eastman Dental Hospital and Institute, 256 Gray's Inn Road, London, WC1X 8LD, England. ■

Membership Has Its Rewards — Financial Times

Mutual funds that are available exclusively to members of a profession — like CDA's RSP program — generally produce higher returns for



Dean Barry Sessle receives the 1994 J.J. Pindborg Award (l. to r.): Mr. Joachim Mall, Munksgaard managing director; Professor Jens J. Pindborg; Dr. Barry Sessle, award recipient; and Dr. Eigild Moller, vice-dean, school of dentistry, University of Copenhagen.

participants than "main-stream" mutuals says the *Financial Times Of Canada*.

In an April 2 report on mutual funds, the *Financial Times Of Canada* stated: "Membership has its rewards when it comes to mutual funds. Just ask any of the dentists or doctors who have invested in so-called affinity funds, available only to their professions."

The article, written by the paper's associate editor, Rudy Luukko, went on to state that affinity funds can be customized versions of existing retail funds, and cited the Canadian Dental Service Plans Inc. (CDSPI) common stock fund as a model of success. CDSPI's common stock fund has been managed by Altamira Management Ltd since March 1, 1994.

"Dentists also now have a cheaper way to buy into the stock-picking talents of Sue Coleman, Altamira's emerging-growth specialist," said Luukko in the *Times* article. "The newly-launched CDA Aggressive Equity Fund that she runs will have its expense ratio kept below one per cent compared with 1.81 per cent for Coleman's Altamira Special Growth Fund. Dentists can expect to pocket the difference over the long haul." ■

Special Athletes, Special Smiles — A First for Canada

When more than 700 athletes converged in Hamilton for the 1994 Ontario Special Olympics May 5-8, a unique program took shape for the first time ever in Canada.

Called Special Athletes, Special Smiles, the program provided participating athletes with dental screenings and educational instruction. Its goal was to help improve access to dental care for people with handicaps, as well as to raise public awareness of the oral health problems faced by this population.

The dental screenings, sponsored by the dental faculties of the universities of Western Ontario and Toronto, were performed by more than 50 volunteers, including 35 dental students. Dr. Clive Friedman, of London, Ontario, the president elect of the American Academy of Dentistry For Persons With Disabili-

Edmonton Dental Society Elects New Directors



The Edmonton & District Dental Society recently elected its directors for 1994-1995 (Back Row, l. to r.): Dr. Randy Crowell, Dr. David Oyen, Dr. Catherine Fletcher, Dr. Carl Osadetz; (Front Row, l. to r.): Dr. Douglas Lobb, Dr. Elena Hernandez-Kuzey, Dr. Rick Easton, Dr. Patricia Allewell, Dr. Roy Fearon.

ties (ADPD), said: "Access to dental care can be an obstacle for persons with mental handicaps because some practitioners lack the facilities, equipment or expertise to serve them. Left untreated, problems which are preventable by ordinary oral hygiene can lead to more serious and costly medical complications."

The athletes who took advantage of the dental screening program were told whether they needed treatment or not, although an exact diagnosis was not made. A written statement identifying needed treatment was given to each athlete. A few weeks after the games, another written statement of needed treatment was sent to the athlete as a reminder to see the dentist. All athletes received a list of dental practitioners in Ontario who are equipped to handle special needs patients.

Each athlete visiting the screening booth also received a package that included a toothbrush, floss and a booklet on oral hygiene, as well as a T-shirt displaying the Special Olympic's logo and the logos of the University of Toronto and the University of Western Ontario. ■

Ontario Orthodontists Elect 1994-95 Board

The Ontario Association of Orthodontists has elected its officers for the 1994-95 session. Serving on the association's executive board are: Dr. Richard Marcus, Scarborough, president; Dr. Hugh Fraser, Brampton, vice-president; Dr. Gordon Organ, Mississauga, secretary-treasurer; Dr. John Doucet, Niagara Falls, past-president. ■

Obituaries

Kasdorf, Dr. John: Dr. Kasdorf graduated from the University of Alberta's faculty of dentistry in 1952. He died March 6, 1994, at the age of 71.

Martin, Dr. James Crawford: Dr. Martin graduated from the University of Alberta's faculty of dentistry in 1955. He last practised in Victoria, B.C., and died March 17, 1994, at the age of 63.

Stephenson, Dr. Don: Dr. Stephenson graduated from Dalhousie University's faculty of dentistry in 1979. He died in March 1994.

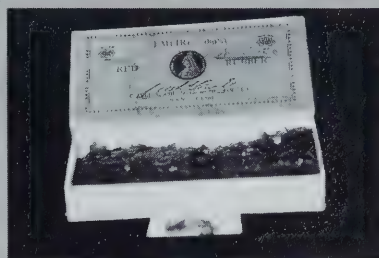
Tremner, Dr Ottis G.: Dr. Tremner graduated from the Royal College of Dental Surgeons of Ontario in 1925. He died on April 2, 1994.

Errata

In the acknowledgements to the article "Restorative Decision Making by Ontario Dentists, by O.M. El-Mowafy and D.W. Lewis, *J Can Dent Assoc* 60:305-316, 1994, the statement indicating grant support for the research by the Ontario Ministry of Health should have indicated that this grant was provided to the Community Dental Health Services Research Unit (CDHSRU), faculty of dentistry, University of Toronto, and the North York (Ontario) Department of Public Health. Also, at the time of this research, Dr. Lewis worked for CDHSRU rather than the research unit indicated in the acknowledgement.

"WHAT'S IT?"

Our "What's It?" corner only received three responses identifying the March 1994 mystery item — the red flakes in the old compound box. The correct response, we believe, came from Dr. Jacqueline Vance Touhey of North Vancouver, B.C. Dr. Touhey writes, "We used orange flake shellac in my Dad's dental lab, where I was a 'plaster monkey' about 55 years ago. We dissolved it in hot water and kept it warm all day. We used it as an excellent separating medium when flasking denture wax-ups." ■



In Communiqué This Month...

- Three Candidates Vie For CDA Vice-Presidency
- CDA Lobbying Efforts Gain National Attention
- CDA Broadens Its Product Recognition Program
- New Name For CDA's Executive Services Department
- The Evolution of CDA's Dental Aptitude Test

News

- Fluoride Proves Effective In Treating Osteoporosis
- Laval: One More Victory For Fluoridation
- Acupuncture: Its Implications For Dentistry

Special Features

- Student's Corner: Planning a Successful Dental Practice
- Personal Finances: Strategies For Income Tax Splitting
- Viewpoint: Retailing In Dentistry — Do We Need It?

Look for these stories and more in the June Issue of Communiqué. CDA members receive Communiqué six times per year in the language of their choice as a benefit of membership in CDA. For More Information, Or To Join Your National Association, call 1-800-267-6354.

JOURNAL

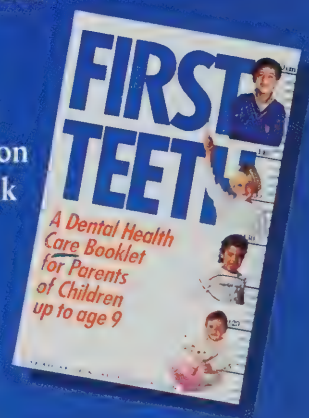
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First Things First ... Small Smiles to Grow On.

Put little smiles in your practice with First Teeth. An award winning program from the Canadian Dental Association that answers parents' concerns about children's dental health.

For parents of children up to age 9, this popular program includes a 24 page booklet and colourful growth chart filled with practical information to help parents teach their children good lifelong dental health care habits.

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1-800-267-6354

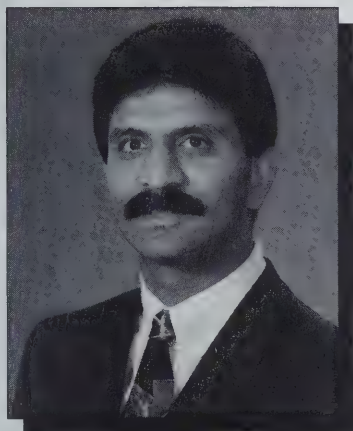
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**CANADIAN
DENTAL
ASSOCIATION**





Meeting the Needs Of Special-Needs Patients

Imtiaz Manji, B.Sc.

President of ExperDent

Last month, we looked at how the particular needs of geriatric patients can best be met in general dental practices. However, seniors are not the only population that poses unique practice management issues. Treating special-needs patients — be they mentally or physically disabled, or medically compromised — also raises unique concerns for the dental team.

Gauging Our Attitudes

In recent years, positive steps have been taken to improve the quality of life of the disabled and to sensitize society to their particular needs. Examples of this trend include such things as the amendments made to building codes in many jurisdictions to make public facilities wheelchair accessible, and television networks offering newscasts in sign language for their deaf viewers. Thankfully, individuals with disabilities are no longer as segregated from society as they once were.

But what role, if any, are dentists and their teams playing here? Are they, through their professional expertise, contributing to the overall health of the disabled and thereby assisting these individuals in leading productive, meaningful lives? Are dental practitioners up-to-speed with the rest of society when it comes to providing services to

individuals with disabilities, lagging behind or leading the way?

According to pediatric dentist Dr. Clive Friedman, the president-elect of the American Academy of Dentistry for Persons with Disabilities (ADPD), there are pockets of progress in dentistry when it comes to meeting the oral health needs of special-needs patients, but the dental profession, as a whole, needs to adopt a different mind-set about this population. Because of existing barriers to oral health care for special-needs patients, "treatment, particularly with multiple handicapped patients, is often forgone," says Dr. Friedman. "This is not acceptable."

Dr. Leonard Smith, a pediatric dentist and past-president of the Academy of Dentistry for the Handicapped (the predecessor of ADPD) underscores this point. His Calgary-based practices, staffed by both general dentists and an orthodontist, treat special-needs patients of all ages. This population accounts for approximately 20 per cent of his patient base, and includes individuals who are autistic, emotionally disturbed, medically compromised or quadriplegic. Equally important, Dr. Smith's practices also employ a special-needs person, full time, to handle instrument cleaning and sterilization.

"One of the first things I had to do when I began practising (over

20 years ago) was to get the message out to parents and caregivers that regular dental care is vital to improving the quality of life of special-needs patients," says Dr. Smith.

Using Education To Overcome Barriers To Care

Clearly, if special-needs individuals are dependent on others, educating these caregivers about oral health is paramount. But that is only one part of the education equation — the other part concerns the dental team itself. How do you gear up your practice to provide quality care to special-needs patients?

The first issue to address is the team's attitude. With special-needs patients comprising part of your patient base, you must ensure that your team members are not just qualified in their particular duties, but also that they embody the awareness, sensitivity and patience that is vital in successfully treating these individuals. In tangible terms, this includes everything from being ready and willing to assist physically-disabled patients in negotiating their way around the practice, to understanding how the complex medical status of a special-needs individual relates to his or her dental health. But treating special-needs patients can pose other challenges, too, some of which may catch team members off guard.

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Because there is an extremely high incidence of physical and sexual abuse against disabled individuals, the fear factor for special-needs patients, particularly those who have been abused in a manner that involved their mouth, can be profound. According to Dr. Friedman, this fear, combined with the fact that the patient may have communication difficulties, demands a highly-trained and sensitive team.

Says Dr. Smith: "When I interview prospective staff, the issue of special-needs patients is a major factor. If they aren't comfortable treating or dealing with special-needs patients, it doesn't matter how great their credentials are, they won't become a part of our team."

Some dental professionals are reluctant to treat special-needs individuals because they feel they aren't qualified to do so, or they feel uncomfortable when they are around these individuals. These professionals lack adequate training to care for such patients. Although treatment of special-needs patients is addressed in most pediatric programs, the subject receives abbreviated attention, at best (save for a few notable exceptions), in the curricula of most dental schools and hygiene programs.

However, there are encouraging signs that this is changing. A good example of the new trend is ADPD's *Special Athletes, Special Smiles* program, which made dental screening available for the 700-plus athletes who participated in the Special Olympics Spring Games last month in Hamilton, Ontario. Many individuals from across Ontario volunteered their time to the program, including dental students, dentists, and support staff.

Dr. Friedman is particularly excited about such programs. "This presented an opportunity for us to identify the need for care in this segment of the population. But it also allowed us to increase public awareness and to provide a forum to expose soon-to-be dentists and established practitioners to special-needs individuals. Hopefully, such experiences will help them to develop an interest in, at the very

least, providing minimum care (an oral exam and dental hygiene instruction) to these patients."

The combination of educating caregivers about the importance of oral health for special-needs individuals, and dental teams on how to provide that care, is a prerequisite for serving special-needs patients. But as Dr. Friedman points out, educating your other patients, i.e. those who don't have special needs, is equally important in successfully integrating special-needs patients into your practice.

"We don't segregate special-needs patients from other patients," he says. "They share the reception area and have the same rights and flexibility with appointments, etc. that all patients have." Because of the particular circumstances related to treating special-needs patients, communication is key. "For example, some special-needs patients need to be restrained during treatment and may scream as a coping mechanism," said Dr. Friedman. "It's important, particularly in an open-concept office like ours, that other patients know why this noise is occurring."

Financial Implications

For some practitioners, financial concerns may be a disincentive to treat special-needs patients. But this is rather shortsighted. Although some special-needs patients do not have traditional forms of dental insurance, and some are in low-income categories, many government-sponsored programs exist to cover their health-care costs, including dental care. (As this varies across the country, your provincial body should be able to advise you further.)

Although special-needs patients require more time and management from the dental team, Dr. Smith says that it can be incredibly satisfying to serve this population — and it is definitely a practice builder. "Some dentists dismiss treating special-needs patients, claiming that they can't profit from it. But they're not looking at the big picture. When you demonstrate your ability — both clinically and managerially — to provide oral health care to special-needs patients, you gain the confidence of

all those who come into contact with them, including caregivers, health-care professionals, support workers, families, and friends. They often become your patients too."

Dr. Friedman agrees, saying that people with special-needs friends take notice of the health-care providers who treat special-needs patients. "They have frequently witnessed the limited access to dental care. They are relieved to find providers of care, and reward such practices with referrals."

Team Morale

In terms of practice cohesiveness, it is interesting to note the effect that treating special-needs patients can have on the morale and fabric of the dental team. For example, Dr. Friedman's entire dental team all volunteered for the recent *Special Athletes, Special Smiles* program.

"I think my team gets a strong feeling of accomplishment from treating special-needs patients," he says. "It's an entirely different experience to finish treating, for example, a patient with Down's syndrome who casts you a huge smile or gives you a bear hug."

Both Dr. Smith and Dr. Friedman believe that their low staff turnover reflects, at least partially, the dedication of their teams to treating special-needs patients.

Summary

In today's society, the trend is toward massive de-institutionalization of individuals with special needs. With the growth of community-based facilities and health-care, dentists need to embrace the challenge of meeting the oral health needs of special-needs patients. To do so, and establish a trust relationship with these patients, they will require training, education and, above all, compassion. Through accessibility, the provision of care and positive attitudes, the dental profession can profoundly assist in improving the quality of life of special-needs patients. ■

BOOK REVIEWS

Oral and Maxillofacial Infections, 3rd edition

edited by Richard G. Topazian and Morton H. Goldberg

W. B. Saunders Company, 1993, 653 pages, \$155.00

The third edition of this well-known, well-accepted text on oral and maxillofacial infections has significant improvements over the previous two. The addition of new chapters on graft and implant infections; infections in the patient who has suffered traumatic injuries; periodontal infections; short- and long-term complications of oral and maxillofacial infections; and medico-legal aspects of infections are particularly significant in this regard. With these valuable additions, the book now comprises 24 chapters and has an extensive index.

Along with several colored plates, the book contains a large number of excellent illustrations and black-and-white photographs. The chapters entitled Infections and the Host; Microbiology of Oral and Maxillofacial Infections; and Laboratory Diagnostic Techniques are particularly good. The book is written in a style that is clear and easy to read, and gives readers an excellent review of these basic concepts without overwhelming them with unnecessary detail.

The chapter entitled Diagnostic Imaging of Maxillofacial and Facial Space Infections is first rate, and there is also an excellent list of 160 references. Dr. Peterson's outline of the principles of antibiotic therapy is well done and, of course, Morton Goldberg and Richard Topazian are both well known among dentists and oral and maxillofacial surgeons for their expertise and knowledge in odontogenic infections, osteomyelitis of the jaws, infections of the salivary glands, and uncommon infections of the oral and maxillofacial regions.

An interesting chapter on the prevention and control of infection in the surgical patient includes a succinct historical review of this

subject, and will be of particular value to those interested in infection control in the office setting. For the Canadian reader, the chapter on the medico-legal aspects of infection thankfully avoids reference to specific U.S. laws. This chapter, which is new to the third edition, therefore makes for interesting and useful reading.

Oral and Maxillofacial Infections is a good piece of work that will be useful as a reference book for general practitioners of dentistry and as a day-to-day guide for oral and maxillofacial surgeons.

Reviewed by:

Dr. David S. Precious, DDS, M.Sc., FRCD(C) Professor and Director of the Graduate Training Program of Oral and Maxillofacial Surgery, Dalhousie University

Pain Control, 2nd edition

by Norman Trierger

C. V. Mosby Co., 1994, 175 pages, 71 illustrations

This is the second edition of a rather classic book that was written more than 20 years ago by one of the pioneers in the development and promotion of anesthesia, particularly as it applies to dentistry.

Each chapter in this hard-cover edition concludes with a list of references. Although many of them are 30 or more years old, there are numerous current references as well. The text is directly referenced from beginning to end.

The book's guiding principles emphasize individual patient evaluation, as well as individualizing actual patient management via the careful selection and titration of medications. It contains 10 chapters, which cover the full gamut of headings that one would expect to find in a much larger, more comprehensive text. There are chapters on pain control; patient evaluation; new approaches to local anesthesia; oral, intramuscular, intrave-

nous and inhalation sedation; and general anesthesia (both outpatient and in hospital) complications and emergencies. The body of the text is followed by an appendix that lists trade and generic drug names, as well as an index.

It is remarkable that a book of less than 200 pages covers such a vast array of topics so efficiently. I would say, however, that the author's intent is only to familiarize readers with the subjects addressed, and not to provide them with enough information to be truly proficient in these areas. It would take a text with far more completeness, including in-depth physiology and pharmacology, to accomplish that.

The book has a distinctive historical flare — no doubt originating from the first edition — with in-depth descriptions of such things as the Jorgenson and Shane techniques of intravenous sedation; the now rarely, if ever, used narcotic Nisental; the general anesthetic trichloroethylene; and several emergency modalities that are now somewhat out-of-date.

On the positive side, this text contains a very useful review of the literature with respect to anesthesia morbidity and mortality for both inpatient and outpatient procedures. It also correctly emphasizes the problems in extrapolating results from the hospital situation to the outpatient dental office.

In summary, this book would be useful for an anesthesia resident who is beginning training and who desires not only an initial overview of the subject, but considerable detail as well. The book's title, *Pain Control*, would be more complete and accurate if it in some way mentioned patient management as well, as this seems to be the main thrust of the text.

Reviewed by:

E.R. Young, B.Sc., DDS, B.Sc.D., M.Sc., FADSA, Associate Professor and Head of the Department of Anesthesia at the Faculty of Dentistry, University of Toronto and the Wellesley Hospital.

JOURNAL

June/
June
1994
Vol. 60
No. 6

Endodontie Clinique

par Lief Tronstad

Traduction française par professeur
Pierre Laudenbach
Médecine — Sciences, Flammarion,
Paris

Ce manuel d'endodontie, d'un format un peu plus grand que celui d'un livre de poche, est un recueil d'informations scientifiques inépuisables.

Les trois premiers chapîtres sont consacrés à l'étude de l'anatomie, de la physiologie et l'histopathologie de l'organe dentaire, du parodonté apical et de la sémiologie endodontique. Il nécessite de la part du lecteur une maîtrise approfondie des sciences de base, sinon c'est la déroute totale ou partielle et inévitablement le désintéressement.

Le chapitre suivant traite de l'examen et du diagnostic endodontiques avec brièveté sans toutefois omettre le moindre détail pertinent.

C'est le premier livre qui mentionne le syndrome de l'algodystrophie de l'appareil manducateur (SADAM) et la névrite herpétique dans le diagnostic différentiel des lésions pulpo-périapicales. L'auteur semble optimiste des résultats obtenus par le flux-mètre Doppler à laser (vitalomètre au laser qui est supposé mesurer la vitalité de la pulpe dentaire par le degré de sa vascularisation au lieu de son innervation). On espère qu'il a raison de son optimisme et nous souhaitons bonne chance et le succès à tous les chercheurs spécialisés dans cette étude car c'est entre leurs mains que réside l'outil du progrès dans le domaine du diagnostic pulpaire. Pour le moment, disons qu'aujourd'hui n'est pas la veille de ce jour heureux. De plus un système de diagnostic clinique et pratique n'utilisant qu'une terminologie strictement clinique est proposée par l'auteur afin de simplifier le diagnostic et éviter une nosologie qui comporte des termes histopathologiques et cliniques de façon concomitante.

Le traitement endodontique est divisé et réservé aux dents à pulpe vivante et aux pulpes nécrosées

(chapître cinq et six). Une description méthodique claire et nette des principes thérapeutiques et des considérations cliniques qui régissent des actes opératoires à partir du coiffage pulpaire jusqu'à la chirurgie périapicale et la réimplantation intentionnelle (programmée est le terme employé), et ceci en passant par l'apexification et l'apexogénèse. Inévitablement l'auteur en sa qualité comme l'un des patriarche de l'endodontie scandinave préconise l'emploi de l'hydroxyde de calcium comme médication intra-canaulaire par intérim de routine lors du traitement des dents à pulpe gangrenée

L'urgence endodontique est décrite dans le septième chapitre, les techniques proposées sont un peu différentes de celles recommandées par les autres auteurs — F. Weine, par exemple — mais l'essentiel est là, preuves et études à l'appui.

Le huitième chapitre est entièrement consacré à l'étude des rhizalises, étiologie, pathologie, évolution, traitement et pronostic. Inévitablement nul autre que M. Tronstad peut faire un aussi bon exposé, on ne peut demander mieux!

Les neuvième, 10^e, 11^e et 12^e chapîtres sont réservés aux instruments, matériaux, techniques endodontiques et la morphologie dentaires respectivement. Quoique brefs ces chapîtres couvrent de façon globale l'essentiel de la matière, l'accent est mis sur la préparation à "boîte apicale." L'auteur parle aussi de la technique de la "chloro-percha" pour l'obturation des canaux, ceci est inévitable étant l'élève de Nygaard-Otsby, mais n'oublions pas que l'emploi du chloroforme chez-nous est pratiquement banni.

Les complications des traitements endodontiques sont discutées dans le 13^e chapitre de façon très compréhensible et le texte est bien organisé, tant pour le blanchiment et la restauration des dents dépulpees qui constituent les 14^e et 15^e chapîtres.

Le tout dernier chapitre est réservé au pronostic endodontique où en deux pages bien claires le résumé de la matière existe en quasi totalité. En somme, comme

l'a déjà dit notre collègue et homologue de l'Université de l'Alberta, D^r William H. Christie (*Journal de l'ADC*, mai 1993, vol. 59, no. 5), cet ouvrage de 238 pages accompagné de 533 illustrations peut induire le lecteur en erreur, par son titre de *Endodontie Clinique*, car en général l'accent est placé sur le côté endodontologie, qu'endodontie clinique, c'est-à-dire: pratique.

En effet les chapîtres consacrés à la morphologie dentaire, au nettoyage, à la mise en forme et l'obturation canalaire ne sont point suffisamment détaillés pour faciliter la compréhension et la maîtrise de ces techniques opératoires cliniques, idem pour la section qui traite de la chirurgie apicale. Et ceci est en complet désaccord avec la volonté primaire de l'auteur, voulant que le livre soit destiné surtout comme manuel de référence pour les étudiants néophytes de l'endodontie. Toutefois, il demeure une référence de valeur immuable pour le praticien qui désire approfondir ses connaissances des différents principes qui régissent l'endothérapie clinique. Aussi, il est de notre devoir d'aviser nos collègues que la version anglaise de cet ouvrage (Thieme Medical Publishers, Inc., New York, 1991) se vend pour la modique somme de 32,36\$, tandis que la traduction française se vend 108,65\$.

Critique par:

D^r S. Sakkal et D^r L. Lemian, section d'endodontie, faculté de médecine dentaire, Université de Montréal.

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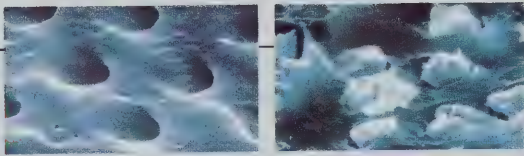
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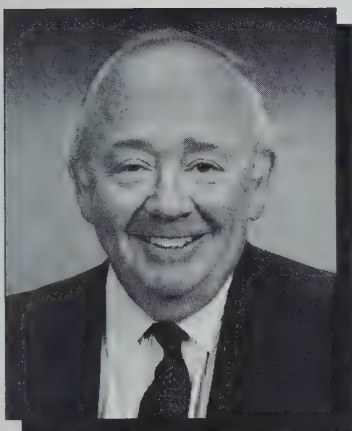
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The Insurance Claim Process: How CDSPI and You Can Maintain An Excellent Record

Dr. Rod Moran

President of CDSPI

Insurance is a funny business. Like many Canadians, dentists pay premiums to buy coverage. But we do so in the hope that we'll never face a predicament where we actually have to collect the benefits to which these premiums entitle us.

Of course, some of us will ultimately experience a situation that leads to collecting benefits. Then the last thing we want is a problem with our insurance claim—we've already endured enough hardship contending with the insurable incident.

At Canadian Dental Service Plans Inc. (CDSPI), one of our most important functions is to ensure that the insurance claims process runs as smoothly as possible. While it is the insurer, not CDSPI, that adjudicates and pays your claim, we are involved throughout the process as your liaison with the insurer. Acting as your liaison, we do everything we can to ensure that you're completely satisfied with the claims process.

We're proud to state that the vast majority of insurance claims—from reporting the incident to receiving the cheque—are processed virtually problem-free.

But to maintain and even improve our record, we largely depend on you. There are certain steps you can follow before and during an insurance claim to ensure that it is handled as quickly and as efficiently as possible.

Consider the Canadian Dentists' Insurance Program (CDIP) long-term disability plan. It's extremely important to call CDSPI—immediately—at the onset of a disability. This is true regardless of the elimination period you have (i.e. the waiting period before benefits begin), or whether your disability is total or partial. Even if you're not sure that a claim situation exists—perhaps you just have a minor illness—call us. Once you notify CDSPI, we notify the insurer and send you a claims kit.

Even if you think the disability won't last beyond your elimination period, it's still important to report it and complete the forms. You never know if complications will arise.

The next step in helping claims go smoothly is to fill in the necessary forms completely and properly. If you don't, the processing of your claim could be delayed. Fortunately for dentists, CDSPI's caring and knowledgeable claims staff is ready and able to help you with all the paperwork. Also, you should mail any required documentation as soon as possible. All of this is extremely important—an insurer can deny a claim that's not submitted within 90 days of the onset of the disability.

The earliest you should expect to receive your disability cheque is three weeks after your elimination period is over, but that's only if you

get your completed claim forms to the insurer on time. When it comes to claims, time is money.

Understand Your Plans

One of the best—and easiest—ways to avoid problems with insurance claims is to be sure you clearly understand your insurance plans. Start by reviewing the plan information you've received from CDSPI. If you have any questions, the CDSPI Personal Service Representative serving your region will be pleased to answer them, and is only a phone call away.

If you don't review your plans from time to time, it's easy to forget some of the details. Let's say you have TripleGuard office insurance, for example, and you only read over the details when you purchased the plan. You may have forgotten that claims under \$1,000 have a \$250 or \$500 deductible, whichever you chose when you enrolled.

While I'm on the subject of office insurance, let me mention some of the most important things you can do to make these claims go more smoothly. It all begins before an insurance incident occurs. You should have a complete list of your office contents, and ideally you should videotape or photograph all your equipment and furnishings as well. Of course, your list, photos, video, and the invoices for all purchases should be kept off-site, so

they'll be available in any emergency, from fire to flood.

If an insurable incident occurs, call the CDSPI claims department right away, even on the weekend. CDSPI monitors and responds to weekend calls through its Emergency Claim Response Service. It's also very important to cooperate fully with the insurance company adjuster.

CDSPI Monitors Its Own Performance

Whenever dentists have an insurance claim, they are sent a survey form to obtain their opinions on how the claim was handled. Disability surveys are handled by CDSPI, while practice insurance surveys are handled by the insurance company involved. I urge you to complete those forms and send them in — CDSPI needs your input to continuously upgrade our own service, and we also need to know whether or not the insurance company is providing good service. With the large number of office claims this year, due to the unusually harsh winter we just endured, we've heard back from a lot of dentists, and there is certainly a large sample of data on hand to evaluate the services you receive from both CDSPI and the insurers.

In general, your comments are overwhelmingly positive. CDSPI and the insurance companies have been rated highly in terms of responding in good time, providing the right information, being helpful, and settling claims smoothly.

When difficulties do surface, the frequency of our survey reports allows us to address them promptly. For example, the results of our long-term disability survey are compiled monthly. Not long ago, these survey results suggested a way to help the insurance company improve its response to claims. The CDSPI claims supervisor met with the insurer right away to discuss the situation, and the next monthly survey report showed a dramatic improvement. That's one of the advantages of being a CDIP participant — if a problem ever arises with the insurance company, we're here to act on your behalf.

There's one area, however, in which a third party like CDSPI is not allowed to provide assistance, namely problems with disability claims involving the specific nature of the disability. It's all because of the confidentiality of medical information. For your own protection, medical information about your disability is held in confidence between your physician and the insurance company. No third party — whether its CDSPI, a broker or an agent — can be involved in adjudication or related matters where this type of privileged information could be disclosed.

On the office insurance side, all I have to do is point out what is

likely the most important question on the claims service survey: "Overall, were you satisfied with the service provided by the adjuster?"

In the last 100 surveys we've received, there have been 99 "yes" responses, and zero "no" responses (one dentist wrote in "okay").

We have an excellent record in making the insurance claims process as problem-free as possible. But, of course, it's a two-way street. Both you and CDSPI must take the right steps to make claims go smoothly. And if each of us does an even better job, we can continue to improve our record in the future. ■

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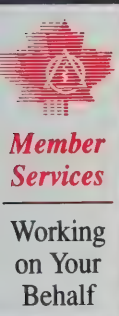
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*Dr. Richard Rayman
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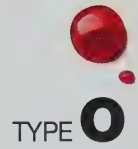
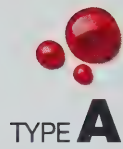
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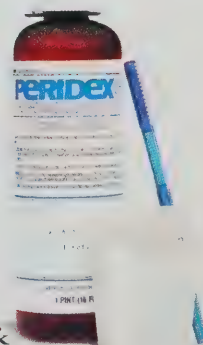
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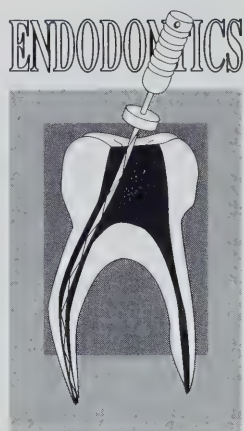
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Re-Implantation Of Avulsed Maxillary Incisors: A Six-Year Case Report

D.F. Davidson, DMD.

V.K. Horbay, DDS

It is a well known fact that the long-term prognosis following re-implantation of avulsed teeth is at best questionable, particularly where there is a significant delay in the re-implantation process.¹⁻⁴

On October 17, 1987, a 17-year-old patient totally avulsed her maxillary right central and lateral incisors during a sports related accident. Unaware of the need for immediate re-implantation, the patient wrapped the avulsed teeth in tissue paper and placed them in her purse. She arranged for a dental appointment six days later, on October 23, 1987, and arrived with the avulsed incisors still wrapped in tissue.

Facial lacerations, bruises or swelling were not observed, and examination of the sockets indicated that normal healing was in progress (**Fig. 1**). The teeth were placed in a dappen dish filled with local anesthetic solution (Xylocaine) and two-per-cent epinephrine.

Root canal filling procedures were performed on both teeth. The root canals were reamed and filed, flushed with hydrogen peroxide and sodium hypochlorite and filled with gutta percha, and the apical areas were heat sealed.

The affected maxillary socket area was anesthetized, and the granulation tissue filling the sock-



Fig. 1: Radiograph of maxillary right incisor region showing total avulsion of the central and lateral incisors — October 23, 1987.

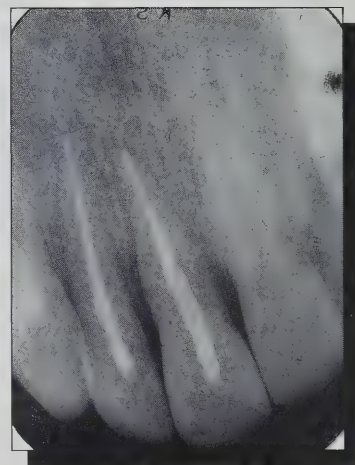


Fig. 2: Periapical radiograph of maxillary right central and lateral incisors four days after re-implantation — October 27, 1987.

ets was debrided using a small pear-shaped acrylic trimmer, followed by a small tapered-bone drill in a low-speed straight handpiece. The teeth were immersed in Sevricon conditioning solution (acetic acid) for 20 seconds and then washed with local anesthetic solution, followed by careful re-implantation into the prepared sockets. The gingival tissues were then compressed to the teeth using finger pressure, with surgical gauze to control hemorrhage. After careful examination of the occlusion to en-

sure that there were no occlusal interferences, a Durelon splint was placed on the labial surfaces from the maxillary right canine to the maxillary left central incisors. The patient was placed on antibiotic therapy for 10 days (Rovamycin 500), and instructed to restrict herself to a soft diet and avoid functional trauma in the injured area.

The patient presented four days later, on October 27, 1987. Both clinically and radiographically, healing appeared to be progressing normally (**Fig. 2**). The patient was

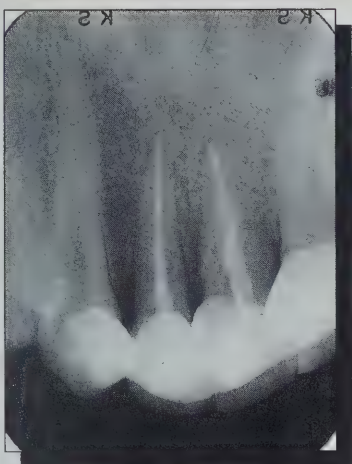


Fig. 3: Periapical radiograph of maxillary right incisor, canine region after cementation of cast bar splint from 13 to 21 — November 26, 1987.

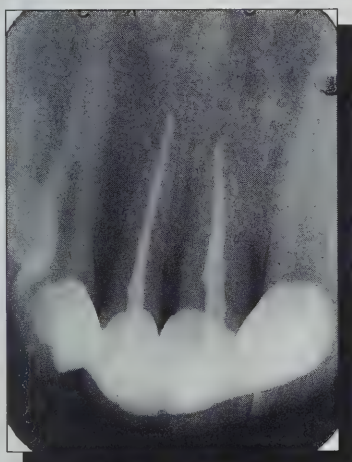


Fig. 4: Periapical radiograph of maxillary right incisor, canine region before cast bar splint removal — August 29, 1988.

recalled at bi-weekly intervals and carefully examined. The splint was repaired on those occasions when fracture was observed.

On November 20, 1987, approximately one month after re-implantation, an alginate impression was taken in order to allow fabrication of a cast bar splint (from 13 to 21), which was cemented in place with Panavia on November 26, 1987 (**Fig. 3**).

Periodic recall and radiographic examination during the following 10-month period indicated normal healing.

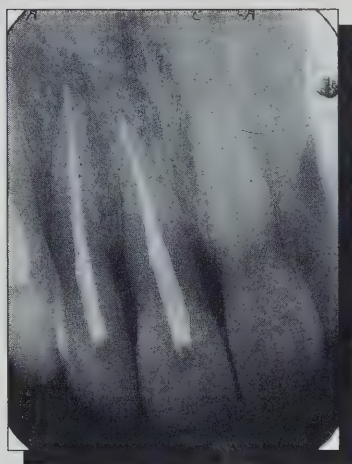


Fig. 5: Periapical radiographs of maxillary left central incisor; a) prior to root canal therapy; and b) after root canal therapy — March 3, 1989.

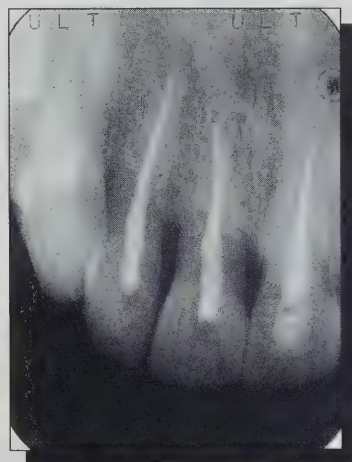
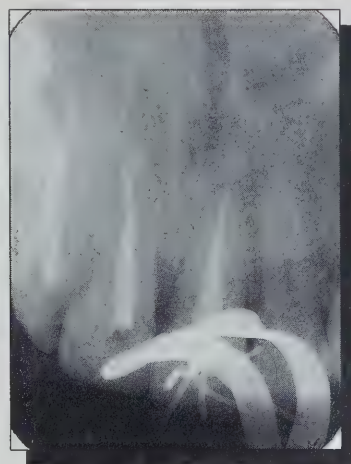
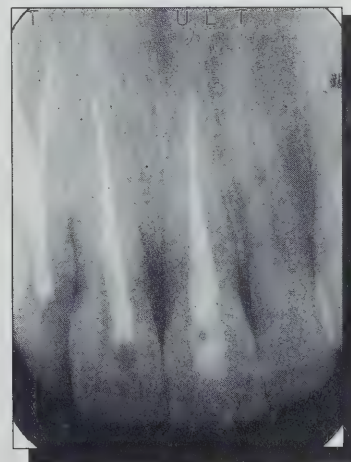


Fig. 6: Periapical radiographs of maxillary incisor region at five year recall — January 28, 1992.



Having served its purpose, the cast bar splint was removed on August 29, 1988 — with difficulty. It was necessary to cut through the bar at each tooth segment, and the individual bar remnants were levered out of position (**Fig. 4**).

The patient was recalled at six-month intervals thereafter. On March 3, 1989, the maxillary left central incisor developed symptoms suggesting earlier damage at the time of the accident, i.e., sensitivity to percussion (**Fig. 5a**). Since symptoms intensified, on April 7, 1989, endodontic treatment was

completed without complication (**Fig. 5b**).

Periodic clinical and radiographic examination during subsequent years revealed a close to normal five-year result (**Fig. 6**). The most recent evaluation was made on November 2, 1993, which indicated a close to normal clinical and radiographic appearance (**Fig. 7**).

Discussion

The case described is quite exceptional, since the existing literature clearly indicates that if an avulsed tooth is re-implanted in less than 30 minutes, the five year prog-



Fig. 7: Periapical radiographs of maxillary incisor region six years after re-implantation — November 2, 1993.

nosis approximates 90 per cent. Should re-implantation be attempted two hours after the avulsion, the five year prognosis drops to five per cent. For the avulsed teeth to have been out of the mouth and dry for several days and not show some ankylosis and external resorption six years after re-implantation is clearly exceptional.

The use of Sevriton conditioning solution prior to re-implantation may well have contributed to the long term success of the case under discussion. The conditioning solution, which is mainly dilute acetic acid, results in an etching effect on

the radicular cementum, thereby resulting in a microporous surface favorable for reattachment. The case under discussion clearly suggests that there are notable exceptions to existing long-term statistical survival data on re-implantation prognosis. ■

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ENDODONTICS



A Case Report of Severe External Resorption

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ABSTRACT

External root resorption is a multifactorial process with many causes. Except for transient surface resorption, it is usually considered an irreversible process. Treatment can arrest or retard the resorptive process. Many factors that have been associated with this process include physiologic resorption, local factors, systemic conditions, and idiopathic resorption. This case report documents a 29-year-old white male who suffered a motor vehicle accident and dental trauma nine years ago. The accident resulted in the lateral displacement of the maxillary right canine. The maxillary right lateral incisor, right central incisor and left central incisors were avulsed. The right central incisor was never recovered from the accident site. The other teeth were replanted 90 minutes after the accident and rigidly splinted for six months. They then received root canal treatment, approximately one month after the splint was removed (seven months from time of the trauma). On annual examination, the patient complained of a loose maxillary fixed prosthesis. He was diagnosed with severe external resorption on the right lateral and left central inci-

sors, and severe external replacement resorption on the right canine. This case report reviews the current trends in the treatment of avulsed teeth and the resorptive process.

SOMMAIRE

La résorption radiculaire ou rhizolyse externe est un processus multifactoriel dont les causes sont nombreuses. Sauf pour la résorption de surface passagère, la résorption radiculaire est ordinairement considérée irréversible. Cependant, le traitement peut en arrêter ou retarder le développement. Parmi les nombreux facteurs associés au processus, on compte la résorption physiologique, les facteurs locaux, les conditions systémiques et la résorption idiopathique. Dans le présent rapport de cas, le sujet est un homme blanc de 29 ans qui, lors d'un accident de moto survenu il y a neuf ans, a subi un traumatisme dentaire qui a entraîné un déplacement latéral de sa canine droite supérieure et arraché son incisive latérale droite ainsi que ses incisives centrale droite et gauche supérieures. L'incisive latérale droite n'a pas été retrouvée sur les lieux de l'accident, mais les autres

l'ont été qu'on a replantées 90 minutes plus tard et maintenues fermement attelées pendant six mois. Environ un mois après l'enlèvement des attelles (donc sept mois après le traumatisme), elles ont fait l'objet d'un traitement radiculaire. A un examen annuel, le patient s'est plaint de la mobilité d'une prothèse fixe supérieure. On a alors diagnostiqué une résorption externe grave des incisives latérale droite et centrale gauche. Aussi, dans ce rapport de cas, passe-t-on en revue les orientations actuelles touchant le traitement des dents arrachées et le processus de résorption.

Introduction

External root resorption is considered a multifactorial process that results, sometimes dramatically, in the loss of tooth structure. The factors associated with root resorption have been listed as physiological resorption, local factors, systemic conditions, and idiopathic resorption.¹

Three main types of external root resorption have been associated with traumatic injuries: surface, inflammatory and replacement resorption.¹ Some authors consider cervical root resorption as

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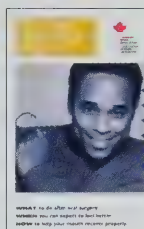
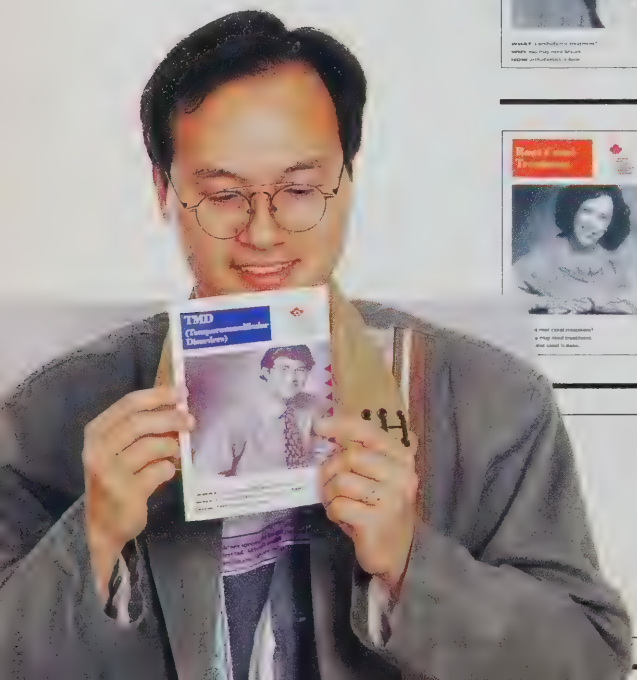
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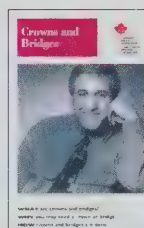
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WHEN you can expect to feel better.
HOW to help your mouth recover properly.

Care after Minor Oral Surgery



WHAT are bleaching, bonding, and veneers?
WHY you may need treatment.
HOW bleaching, bonding, and veneers are done.

Bleaching, Bonding, and Veneers



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WHY you may need a crown or bridge.
HOW crowns and bridges are done.

Crowns and Bridges



WHAT is orthodontic treatment?
WHY you may need braces
HOW orthodontics is done.

Orthodontics



WHAT is root canal treatment?
WHY you may need treatment.
HOW a root canal is done.

Root Canal Treatment



WHAT may be causing your sore jaw.
WHY it is important to treat your TMD.
HOW TMDs can be treated.

TMD (Temporomandibular Disorders)



a fourth distinct entity.⁷ Successful treatment can arrest the process. Less than successful treatment can only retard it.

Surface resorption can be transient or progressive. With transient resorption, the pulp remains vital and the root is usually restored to a normal surface with the deposition of new cementum.¹ However, the process is more aggressive with the progressive variety, and can lead to the more destructive types of resorption, i.e. inflammatory and replacement.¹

Andreason⁶ reported four factors related to inflammatory resorption: 1) injury to the periodontal ligament; 2) initiation of surface resorption; 3) communication with necrotic pulp tissue or an inflammatory zone harboring bacteria; and 4) patency of the dentinal tubules.

Tests that support the diagnosis of external root resorption should include a history of trauma, irreversible pulpitis or necrotic pulp, increased tooth mobility, percussion sensitivity, and radiographic evidence of dentoalveolar resorption.¹ Andreason¹⁰ states that a radiographic viewer with magnification and external light blockage must be used to view the radiograph. He recommends the use of film holders for the comparison of identical radiographs taken three to four weeks subsequent to the trauma. This is critical, since 40 per cent of the root surface may be ankylosed in replacement resorption before it can be determined radiographically.

Resorption may go undetected on the labial and lingual surfaces. Up to 20 per cent of the root must be ankylosed before there will be any detectable decrease in mobility or any change in the percussion sound.

Treatment of inflammatory resorption is based on the removal (or reduction) of the source of infection. Calcium hydroxide ($\text{Ca}(\text{OH})_2$) is recommended as an inter-appointment medication prior to the placement of gutta percha (GP).^{1,2,4,5} Andreason¹⁰ notes that $\text{Ca}(\text{OH})_2$ has a definite effect on bacteria and decreases infection within the root canal system,

but does not effect the osteoclasts external to the root. He therefore recommends antibiotics at the time of replantation, and postponing the placement of the definitive root canal filling. He feels the pulp should be extirpated within one to two weeks of the trauma, and that a $\text{Ca}(\text{OH})_2$ intracanal medicament should be used for a month.

Cvek³ has reported that the arrest of resorption could be ascribed exclusively to the removal of the necrotic pulp rather than to the use or non-use of $\text{Ca}(\text{OH})_2$. This is dependent on each case of resorption. If the root canal system cannot be sufficiently debrided, if hemorrhage control cannot be obtained, and if an apical stop cannot be generated, then it would be best to use $\text{Ca}(\text{OH})_2$ until these problems can be controlled. The American Dental Association (ADA) has recommended⁸ placing $\text{Ca}(\text{OH})_2$ for six to 24 months, but the American Association of Endodontics (AAE)¹² guidelines (**Table I**) now recommend a seven- to 14-day placement period.

Prevention of external root resorption after trauma is based on early detection and treatment, with a careful recall program based on radiographic analysis, pulpal evaluation and clinical observation. A suggested protocol¹ would be:

- 1) Schedule an appointment as soon as possible after the trauma. Treatment is dependent on the development of the root apex. Andreason⁶ has indicated that if the foramen is greater than 1.0 mm, then it should be considered an "open apex" and the pulp tissue may be allowed an attempt at revascularization. If the foramen is open, then it should be followed closely every two weeks for any signs of pathology. If pathology is present, then the pulp is extirpated and $\text{Ca}(\text{OH})_2$ is used.
- 2) If the foramen is closed, then the pulp is extirpated within seven to 14 days and the canal system is packed with $\text{Ca}(\text{OH})_2$. The canal is obturated with gutta percha and sealer after seven to 14 days¹² if no pathology has been noted.

3) Re-evaluation of pulpal vitality at one month, three months, six months, and one year,¹⁰ and then at two to three years¹² is recommended. Radiographs at various angles every four to six weeks for six months are also advised.

4) Treatment may be initiated at any point when there is evidence of resorption. It is prudent to recommend root canal treatment if pulpal necrosis can be ascertained, even in the absence of resorption.

Replacement resorption occurs when the tooth structure is replaced with bone that fuses with the cementum.¹ This occurs most commonly in teeth that have been avulsed, where the periodontal ligament (PDL) dries and loses its "vitality." Experimental studies have shown that dry storage of more than 60 minutes leads to PDL necrosis. The critical time of dry storage is 18-30 minutes.⁶ Andreason¹⁰ noted that if the tooth is placed immediately in saliva or saline, ankylosis is usually curtailed. This type of resorption can be transient or progressive. It is considered transient if only 20 per cent of the tooth surface is involved.¹ Andreason⁶ states that there is an avital PDL if the tooth was avulsed for more than 30 minutes, and resorption prevention treatment is then recommended. He suggests the removal of the PDL and pulp, placing the tooth in 2.4-per-cent sodium fluoride solution for 20 minutes, obturating with GP, replanting and splinting for six months. The current AAE guidelines¹² (**Table I**) state that if more than two hours of dry time have elapsed, the root surface should be soaked for five minutes in a topical fluoride, and the root canal therapy should be performed either extra-orally or intra-orally.

There is no completely successful treatment for replacement resorption, only the possibility of slowing the resorptive process. Andreason⁶ notes that if replacement resorption is to occur, it will usually start within the first year of replantation. He feels that in most cases of trauma, either ankylosis will start within two weeks after replantation, or a new lamina dura will

**Table I**

Treatment of the Avulsed Permanent Tooth[®]

Recommended Guidelines of the American Association of Endodontists¹²



I. Management at Site of Injury

- A. Replant immediately, if possible. If contaminated, rinse with water before replanting.
- B. When immediate replantation is not possible, place tooth in the best transport medium available.

II. Transport Media

- A. Hank's Balanced Salt Solution (H.B.S.S.)
- B. Milk
- C. Saline
- D. Saliva (buccal vestibule)
- E. If none of the above is readily available, use water.

III. Management in the Dental Office

- A. Replantation of Tooth
 1. If extraoral dry time is less than 2 hours, replant immediately.
 2. If extraoral dry time is greater than 2 hours, soak in a topical fluoride for 5 - 20 minutes, rinse with saline and replant.
 3. If tooth has been in any physiological storage media (such as H.B.S.S., milk, or saline), replant immediately.
- B. Management of the Root Surface
 1. Keep the tooth moist at all times.
 2. Do not handle the root surface (hold tooth by the crown).
 3. Do not scrape or brush the root surface or remove the tip of the root.
 4. If the root appears clean, replant as is after rinsing with saline.
 5. If the root surface is contaminated, rinse with H.B.S.S. or saline (use tap water if above are not available). If persistent debris remains on root surface, gently use cotton pliers to remove remaining debris and/or gently brush off debris with a wet sponge.
- C. Management of the Socket
 1. Gently aspirate without entering the socket. If a clot is present, use light irrigation with saline.
 2. Do not curette the socket.
 3. Do not vent socket.
 4. Do not make a surgical flap unless bony fragments prevent replantation.
 5. If the alveolar bone is collapsed and prevents replantation, carefully insert a blunt instrument into the socket to reposition the bone to its original position.
 6. After replantation, manually compress (if spread apart) facial and lingual bony plates.
- D. Management of Soft Tissues - tightly suture any soft tissue lacerations, particularly in the cervical region.
- E. Splinting (indicated in most cases)
 1. Use acid-etch/resin alone or with soft arch wire, or use orthodontic brackets with passive arch wire. Suture in place only if alternative splinting methods are unavailable. (Circumferential wire splints are contraindicated.)
 2. Splint should remain in place for 7-10 days; however, if tooth demonstrates excessive mobility, splint should be replaced until mobility is within acceptable limits.

3. Bony fractures resulting in mobility usually require longer splinting periods (2-8 weeks).
4. Home care during splinting period should encompass:
 - a. No biting on splinted teeth
 - b. Soft diet
 - c. Maintenance of good oral hygiene

IV. Adjunctive Drug Therapy Considerations

- A. Systemic antibiotics
- B. Referral to physician for tetanus consultation within 48 hours
- C. Chlorhexidine rinses
- D. Analgesics

V. Endodontic Treatment

- A. Tooth with open apex (divergent apex) and less than 2 hours extraoral dry time:
 1. Replant in an attempt to revitalize the pulp.
 2. Recall patient every 3-4 weeks for evidence of pathosis.
 3. If pathosis is noted, thoroughly clean and fill the canal with calcium hydroxide (apexification procedure).
- B. Tooth with open apex (divergent apex) and greater than 2 hours extraoral dry time:
 1. Thoroughly clean and fill the canal with calcium hydroxide.
 2. Recall the patient in 6 - 8 weeks.
- C. Tooth with partially to completely closed apex and less than 2 hours extraoral dry time:
 1. Remove the pulp in 7-14 days.
 2. Medicate the canal with calcium hydroxide.
 3. Obsolete canal with gutta percha and sealer after 7-14 days of calcium hydroxide.
- D. Tooth with partially to completely closed apex and greater than 2 hours extraoral dry time:
 1. Perform root canal therapy either intraorally or extraorally.
 2. If treated extraorally, avoid chemical or mechanical damage to root surface.

VI. Restoration of the Avulsed Tooth

- A. Recommended Temporary Restorations (placed prior to final obturation)
 1. Reinforced zinc oxide eugenol
 2. Acid etch/composite resin
- B. Recommended Permanent Restorations (placed immediately after final obturation)
 1. Dentin bonding agent
 2. Acid etch/composite resin

VII. Additional Considerations

- A. Avulsed primary teeth should not be replanted.
- B. Avulsed permanent teeth require follow-up evaluations for a minimum of 2-3 years to determine the outcome of therapy.
- C. Inflammatory resorption, replacement resorption, ankylosis and tooth submergence are potential complications when avulsed teeth are replanted.

Treatment of the Avulsed Permanent Tooth: Recommended Guidelines of the American Association of Endodontists are intended to aid the practitioner in the management and treatment of the accidentally avulsed tooth. Practitioners must always use their own best professional judgement. The American Association of Endodontists neither expressly nor implicitly warrants any positive results associated with the application of these guidelines. Although it is impossible to guarantee permanent retention of a tooth that has been avulsed, timely treatment of the tooth in the proper manner can maximize the chances for success.



Fig. 1: Initial presentation.



Fig. 4: Prosthesis removed and the curretted soft tissue specimens.

form within three to four weeks.¹⁰ He also found that the first radiographic sign of replacement resorption was found three to four months after replantation, and that in most cases it originated in the apical third of the root. This depended on the extent of the damage to the PDL and whether there was functional movement of the injured tooth during the healing period. With more extensive damage, functional stimulation will not be able to prevent the ankylosis. Andreason¹⁰ has reported that greater amounts of ankylosis resulted from rigid fixed splinting. The process in adults may be significantly slow, however, and the affected tooth can survive 10-20 years.⁸

Webber⁵ has recommended that all luxation injuries to teeth, whether laterally, extrusively or intrusively displaced, be placed in one category; that of luxation. He feels replacement resorption does not seem to occur when the PDL is maintained, but that inflammatory resorption is the main problem. He believes that it can be controlled with Ca(OH)_2 , if treated early.¹¹

Case Report

A 29-year-old white male presented with the chief complaint that his maxillary anterior fixed prosthesis was loose (**Fig. 1**). A review of his past dental history revealed a motor vehicle accident nine years ago that resulted in the lateral displacement of the maxillary right canine and the avulsion of the maxillary right lateral, right central and left central incisors,



Fig. 2: Radiograph of the maxillary right lateral incisor and canine.

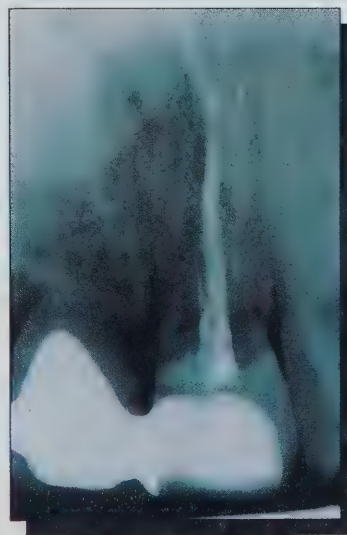


Fig. 3: Radiograph of the maxillary left central incisor.

with the loss of the right central incisor. The patient states that the teeth were replanted one and a half hours after the accident, that rigid fixation was placed for approximately six months, and that definitive root canal treatment was not started until approximately one month after the removal of the splint (seven months from time of the trauma). He could not recall if the dentist had, or had not, utilized Ca(OH)_2 . The patient stated that the teeth were never bleached.

Examination revealed a maxillary acid-etched, resin-retained prosthesis, from the right lateral incisor to the left central incisor, which had a pinkish hue to the remaining crown structure and a Glickman mobility of 2. The peri-

odontal probing depths ranged from 3.0 to 7.0 mm (**Fig. 1**). The right canine exhibited no mobility, did not sound ankylosed when percussed, had no probing depths greater than 3.0 mm, and did not exhibit any unusual color. Radiographic analysis demonstrated severe external resorption on the maxillary right canine, and the right lateral and left central incisors (**Figs. 2 and 3**).

A diagnosis of severe external resorption with an inflammatory granuloma on the maxillary right lateral and left central incisors, and severe replacement resorption on the right canine was made. The differential diagnosis for the right canine also included cervical inflammatory resorption.





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Treatment Plan

The treatment plan included the removal of the maxillary anterior prosthesis with curettage of the sockets, surgical evaluation of the right canine, and placement of a transient acrylic prosthesis. If the right canine appeared salvageable, it would be retained. If not, it would be extracted. A transient partial prosthesis was constructed with those four teeth incorporated.

The acid-etched fixed prosthesis was removed. The sockets were curetted of soft tissue and a material consistent with gutta percha undergoing resorption (Fig. 4). The pathology report confirmed the diagnosis with a report of chronically-inflamed fibrous connective tissue and epithelium consistent with external inflammatory resorption.

The maxillary right canine did not have a fenestration or dehiscence present, and no pathology was noted from the surgical site. The tooth was deemed retainable.

After six months of uneventful healing, the patient was evaluated and accepted for implant placement. On December 15, 1993, surgical evaluation of the site revealed remaining bony defects that required the placement of decalcified freeze-dried bone with a guided tissue regeneration barrier. The right lateral and left central incisor sites will receive endosseous implants after 10 months of healing. In Phase II prosthetic treatment, a three-unit implant-supported fixed prosthesis will be fabricated. At a later date, if the right canine becomes hopeless, it will be extracted and a single implant may be placed.

Conclusions

This case report emphasizes the requirement to follow a set protocol in the replantation of avulsed teeth, such as recommended by AAE (Table I). The length of time before the teeth were replanted, the non-utilization of a $\text{Ca}(\text{OH})_2$ intracanal medicament and the delay of definitive root canal treatment until approximately seven months after the traumatic incident most likely did not improve the prognosis for these teeth. However, it must be noted that the right lat-

eral and left central incisors remained functional for nine years and that the canine is still functional. If the new recommended protocol had been followed, these teeth may have lasted even longer.

Summary

Prevention of external root resorption includes the appropriate treatment of traumatically injured teeth. The key to the arrest or retardation of the resorption process is the early initiation of endodontic therapy when pulpal or periapical pathology is diagnosed. It is recommended to first allow the PDL to heal for seven to 10 days, then to use $\text{Ca}(\text{OH})_2$, and then to place the definitive root canal filling seven to 14 days later. The patient must be followed with clinical observations that include radiographic re-evaluation. Treatment must be initiated when required, even if the patient is asymptomatic. ■

Disclaimer: The views expressed herein are those of the authors and do not necessarily reflect the policies of the Canadian Forces Dental Services, the U.S. Army or the Department of the Defense.

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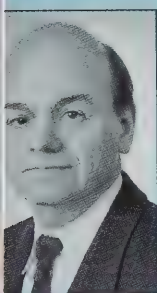
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82ND WORLD DENTAL CONGRESS ♦ VANCOUVER OCTOBER 2ND TO 8TH, 1994

UPDATE ♦ UPDATE ♦ UPDATE ♦ UPDATE ♦ UPDATE

Evenings of Extravaganza!



Each and every night, after the Convention Centre has closed its doors for the day and dusk has descended upon Vancouver, the 82nd World Dental Congress will be offering a variety of social evenings! The week begins, on Sunday night, with a scenic cruise of Vancouver Harbour. On Monday two spectacular functions will take place. The Opening Ceremony

anchors the Congress and is immediately followed by three hours of international food and entertainment. Tuesday night will be an evening of discovery, when the FDI 1994 Congress brings the Orient to you. As mid-week approaches, you can enjoy the festivities of a salmon barbecue and logging show. The week ends with an elegant dinner and dance ball.

The Opening Ceremony, sponsored by Nobelpharma, marks the official start of the 82nd Annual World Dental Congress. This two hour extravaganza features a variety of attractions, promising great enjoyment for all! Sit back, relax, and enjoy two hours of entertainment which will demonstrate the cultural diversity of Canadian society.

The theme continues as Ash Temple sponsors an evening of international flair at the Pan Pacific Hotel. In a matter of three hours, one can sample food and music from around the world. This event will be a unique opportunity to meet other FDI participants in an informal atmosphere.

As the week progresses, each evening features a different aspect of Canadian culture. Vancouver is home to the second largest Chinatown in North America! On Tuesday night participants are invited to come and feast on a large selection of authentic Chinese foods. As one enjoys these exquisite flavours, traditional Chinese dancing and music will be featured!

Wednesday night, come out and see authentic lumberjacks! This evening is a rare occasion for both our Canadian and international friends. The Logger's Sports Show will occur before your very eyes in an outdoor atmosphere! After the show has concluded a buffet of West Coast cuisine will be served; come and taste the delectable flavours of fresh B.C. salmon barbecued right before you! After you have completed your meal, dance the rest of the night away under the shine of the stars and moon.

As the week concludes all are invited to attend the FDI Ball; an exquisite evening of dinner, music and dancing. The theme of Black and White will infiltrate all aspects of the night from the decor to the dress and even to the menu! The dancing rhythm will vary throughout the evening as the music tunes alter their tempo. Listen and dance to the sounds of classical, jazz, swing and rock 'n roll!

Each and every evening will be a highlight of FDI 1994! Don't miss out on this unique opportunity to both see and taste the diversity of Canadian culture. The entertainment is unsurpassed and the fees are nominal. If you have already registered for the Congress without enrolling for an evening, hurry and sign up now! Don't miss out on these evenings of extravaganza!

This is OUR chance to be hosts and welcome the rest of the dental professionals from around the world!

Jim Stich, D.M.D.
Chairperson, Social Program
FDI 1994 Organizing Committee
c/o Canadian Dental Association
1815 Alta Vista Drive
Ottawa, Ontario K1G 3Y6

Tel.: 1-800-267-6354
Fax: (613) 523-3062

OPENING CEREMONY**MONDAY, OCTOBER 3 * 17:15 - 19:30**

The Opening Ceremony of the 82nd Annual World Dental Congress, sponsored by **Nobelpharma**, will take place at the Vancouver Trade and Convention Centre, which is in close proximity to all downtown hotels. Come and enjoy this two-hour extravaganza featuring the best talent Vancouver and Canada have to offer. After short welcoming speeches and a unique and exciting roll call of nations, the show will begin! Dancing and entertainment on the theme of cultural diversity will be the highlight of this program. This event promises to have something for everyone's taste!

All Congress participants are invited to attend the Opening Ceremony. Tickets are available on request to registered participants only — be sure to request your ticket when you register for the FDI Congress.

INTERNATIONAL EVENING**MONDAY, OCTOBER 3 * 19:30 - 22:30**

Continue the celebration of the opening of the 82nd Annual World Dental Congress at the Pan Pacific Hotel where you will be immersed in an international atmosphere. Various international stations with food, song and dance will "transport" you around the world in just three hours! This is the perfect occasion to get to know your colleagues from other countries before the Congress begins.

FDI SCENIC EVENING DINNER CRUISE**SUNDAY, OCTOBER 2 * 19:00 - 22:00**

An evening aboard one of Vancouver's many private yachts gives you a marvelous view of the city and its waterfront. Enjoy a sumptuous West Coast barbecue on board while you watch the scenery and sunset slip by. Live music tops off this relaxing and fun-filled event. In a city surrounded by water, a boat trip is the best possible way to capture West Coast charm and adventure.

DISCOVER THE ORIENT EVENING**TUESDAY, OCTOBER 4 * 19:00 - 23:00**

Vancouver's largest ethnic community, and North America's second largest Chinatown, has fostered the establishment of Chinese cuisine that rivals Hong Kong and Taipei. Enjoy an evening of classical Chinese dance and music as accompaniment to an exquisite selection of foods served at traditional Chinese banquets. This evening, catered by one of the finest restaurants in the city, will be a highlight of the Congress.

SALMON BBQ / LOGGING SHOW**WEDNESDAY, OCTOBER 5 * 19:00 - 24:00**

This unique evening will be a tribute to the legendary man of the wood, the logger. The evening begins with a full scale competitive Logger's Sports Show featuring actual lumberjacks demonstrating the art of axe-throwing, log rolling, pole climbing and many other daring skills. A sumptuous buffet dinner will be served, including the delectable B.C. salmon and a tempting array of hot and cold menu items that feature the finest and freshest in West Coast cuisine. A lively band will keep you dancing until the end of the evening. Casual dress is recommended.

FDI BALL**THURSDAY, OCTOBER 6 * 20:00 - 01:00**

From the menu to the decor, the Black and White theme will be all around you. Be creative with your black and white wardrobe and blend with the decor! A prize will be awarded for the best costume. Music will range from classical to jazz and from swing to rock'n'roll, as a dinner without parallel is served. Black tie is optional.

Door #1, Door #2 or Door #3?

1

Nobelpharma

Exotic Hong Kong in 1995! During the Opening Ceremony at FDI 1994 two airline tickets to FDI 1995 may have your name on them! This draw is made available to registered participants at the '94 Congress by Nobelpharma.

2

Volvo

Congress participants who have registered for FDI '94 prior to May 15th have a chance at winning a brand new Volvo! This luxurious vehicle, donated by Volvo, will be drawn during the Congress and may be yours to enjoy.

3

Aurum Ceramic

Win a motorcycle courtesy of Aurum Ceramic. A 1200 Sportster Harley Davidson, retail value of approximately \$12,000 may be yours to take home! All Canadian dentists who register for the FDI 1994 Congress will be eligible for the draw. Do not miss out on your opportunity!

Class Reunions!



The FDI 1994 Congress is the perfect time to renew old acquaintances as many dental professionals gather together in one place. Numerous dental graduating classes will use this opportunity to renew ties with old classmates. If you would like to organize a class reunion for your graduating year, call the FDI 1994 Organizing Committee at 1-800-267-6354 and we will be happy to help you arrange function rooms for your gathering.

GOLF DAY — WEDNESDAY, OCTOBER 5

— Golfing enthusiasts —
this is your day!

Take part in the FDI golf tournament which will be held at one of Vancouver's lush golf courses — the Swan-e-set Bay Golf & Country Club. There will be two shotgun starts at 8:00 a.m. and 1:00 p.m. on Wednesday, October 5th. Due to space limitations, only 288 golfers (144 golfers for each tee off time) will be registered on a first-come, first-served basis. Register today for this event!

A pull cart will be given to all registered players. A golf shop will be available for rental of golf clubs, power carts and other standard equipment. Your registration fee will include transportation to the golf course as well as a light lunch.



Visits and One-Day Tours

Vancouver City Tour

Monday, October 3
09:00 - 12:00

Tuesday, October 4
09:00 - 12:00

Enjoy a tour aboard our comfortable deluxe coaches and receive an introduction to beautiful Vancouver. We start with a drive through Stanley Park, a 1,000 acre forest set in the heart of downtown. After admiring the magnificent view of the harbour and the North Shore mountains, we move on to one of the city's finest residential areas, Shaughnessy, with its stately homes and impressive embassies. We then proceed to Queen Elizabeth Park to view the sunken gardens and the Bloedel Conservatory, where a rich assortment of flowers and plants from the tropical rainforests are cultivated. Other tour highlights include exotic Chinatown, the second largest Chinese community in North America, and historic Gastown, with its quaint cobblestone streets and unique shops housed in turn-of-the-century buildings.

Salmon Fishing

Monday, October 3
06:30 - 11:30

Friday, October 7
06:30 - 11:30

Take advantage of Vancouver's proximity to the sea and indulge in one of the favourite pastimes of visitors and local folk alike! Spend the day on the water and experience the challenge of salmon fishing in beautiful British Columbia. Relax on a specially equipped fishing yacht while the skipper and fishing rod do the work. All the fish stories you've heard are absolutely true, as Vancouver is indeed a sport fisherman's paradise!

Scenic Harbour Cruise

Tuesday, October 4 • 13:30 - 16:30

A cruise is always a popular choice and with good reason. The charm of the inner harbour is best appreciated from the water itself. Superb views of the city skyline drift by and picture postcard scenery unfolds all around. There are wonderful destinations whatever direction the boat takes. The sights are dazzling and there's the opportunity of spotting harbour seals and other marine life. Light refreshments are served on board to make the journey even more pleasant. In a city surrounded by water, a boat trip is the best possible way to capture Pacific West Coast charm and adventure.

North Shore & Grouse Mountain Tour

Tuesday, October 4
09:00 - 13:00

Thursday, October 6
09:00 - 13:00

This tour will make you feel like you're sitting on top of the world! You will travel via Stanley Park and the Lion's Gate Bridge to the North Shore, and up the Capilano Canyon to the base of Grouse Mountain. Then you'll ascend by sky tram to Grouse's 3,700 foot high vantage point. Enjoy a panoramic view of Vancouver with time to explore or attend the "Theatre in the Sky". Next a visit to the Capilano Suspension Bridge and Fish Hatchery, a fascinating salmon enhancement project noted for its famous "Fish Ladder". Then a visit to the Lonsdale Quay, a wonderful waterfront collage of shops, bistros and markets. Guests are free to explore and then return to the city via Sea Bus for which tickets are provided. The Sea Bus is a 12 minute ride to the city centre crossing the Burrard Inlet. The city terminal is within easy walking distance of the Vancouver Trade and Convention Centre.

Vancouver City & Granville Island

Tuesday, October 4
13:00 - 17:00

Wednesday, October 5
09:00 - 13:00

Board one of our comfortable modern coaches for a fully commented tour of one of the most beautiful cities in the world. The drive through our famous Stanley Park, will display a magnificent view of the harbour. Proceed later to one of the City's most famous residential areas, Shaughnessy, and then to Queen Elizabeth Park with its beautiful sunken gardens and the Bloedel Conservatory to view the rich assortment of tropical plants and birds. Next stop will be Granville Island to peruse the market and visit the shops, galleries and bistros. Here you will have a short period of free time, but for those who wish to explore further, you might consider staying on your own and returning by city bus or mini-ferry. Both have convenient connections and frequent departures.

Visits and One-Day Tours

FDI
1994

Vancouver Aquarium: "Breakfast with the Whales"

Wednesday, October 5 • 07:30 - 10:30

Experience a truly unique way to start the day by taking a whale to brunch! An early departure will take guests to Vancouver's award-winning Public Aquarium to enjoy a buffet style breakfast amidst over 7,000 species of sea life, including both killer and Beluga whales, dolphins, sea otters, sharks and exotic fish. The tour will then continue over the impressive Lion's Gate Bridge enroute to the "North Shore". In North Vancouver, we will visit the famous Capilano Suspension Bridge and Nature Park. For more than a century this bridge has awed thousands of visitors as they walk over its 450 foot span and gaze at the Capilano River 250 feet below. This site also houses a historic log cabin trading post stocked with souvenirs and a resident native Indian Totem Pole carver.



Museum of Anthropology

Wednesday, October 5 Thursday, October 6
13:00 - 16:30 09:00 - 12:30

The Museum of Anthropology, on the grounds of the University of British Columbia, is dedicated to the preservation and presentation of artifacts unique to West Coast Indian culture and is high on the list of must-sees for those with a taste for history and art. The Museum's treasures are housed in an impressive building designed by Arthur Erikson. In addition to the permanent displays, the museum also plays host to various travelling collections. We are pleased to invite you to come with us as we make our way by deluxe motorcoach to one of Canada's most renowned and celebrated museums.

Royal Hudson Steam Train & Britannia Excursion

Thursday, October 6 • 09:30 - 16:00

Enjoy a different scenic perspective of spectacular Howe Sound by joining us on the Royal Hudson steam train. From the first "All Aboard!" the legendary Royal Hudson train takes you as far as the quaint logging town of Squamish. Not only is the train a delightful novelty, it's also the means by which we are able to take in some of B.C.'s most breathtaking scenery as we wind our way through mountains and cliffs, canyons and gorges, complete with waterfalls. It is even possible to spot wildlife such as deer, black bear and bald eagles along the way. After some free time in the town of Squamish, we board the majestic "Britannia" for the return cruise to Vancouver (lunch included). Bring your camera!

A Day in Victoria

Friday, October 7 • 07:30 - 19:30

Victoria, British Columbia's capital is a charming city with a distinct olde-world atmosphere located on Vancouver Island. Our day will begin with a coach ride to Tsawwassen, where we board a B.C. ferry for a 1 1/2 hour cruise. Once we dock, we'll proceed to the Butchart Gardens, perhaps the most awe-inspiring collection of plants and flowers in North America with exquisite examples of landscaping from many countries. After much leisure time, you'll visit Victoria's city centre, for a free afternoon to visit fabulous museums, shops and art galleries.

Whistler Mountain Day Trip

Saturday, October 8 • 09:30 - 17:30

Whistler attracts thousands of visitors year round who come to enjoy the sports facilities, quaint European style village, fabulous shops and restaurants set amid the splendour of alpine scenery. Deluxe motorcoach transportation lets you sit back and enjoy the stunning mountain views enroute. Upon arrival at Whistler Village the time is yours to stroll, shop and participate in the various sporting and sightseeing activities.

3M Canada Inc.

◆ A ◆

A-Dec, Inc.
A.R. Medicom Inc.
Abel Computers Ltd.
ACT Laboratories Ltd.
Advance Medical Products
Advanced Dental Concepts
Aesthetic Porcelain Studios, Inc.
Allstar Dental Laboratories Ltd.
Almore International, Inc.
Alphadental Products Company
Amadent/American Medical & Dental Corporation
American Dental Association
American Dental Technologies Inc.
American Xyrofin, Inc.
Ampco Dental Equipment Inc.
Analytic Technology
APM – Sterngold
Appollo Dental Products
Arm & Hammer Dental Care
Aseptico Inc.
Ash Temple Limited
Astra Pharma Inc.
Aurum Ceramic/Classic Dental Laboratories

◆ B ◆

Becker-Parkin Dental Supply Co. Inc.
Bego Bremer Goldschlaegerei
Bego Canada
Belmont Equipment Corp. Div. Takara Co.
Beutlich L.P.
Bisco Dental Products
Block Drug Company (Canada) Ltd.
The Bonart Co., Ltd.
Brasseler Canada Inc.
Buffalo/Bolton Dental Mfg. Inc.
Burroughs Wellcome Inc.
Byte Dental Systems Inc.

◆ C ◆

Calcitek Inc.
Canadian Dental Association
Canadian Dental Service Plans Inc.
Canadian Dental Supply Ltd.
Canebsco Reception Room Subscription Services
CDAnet
Cendres & Metaux Inc. (Canada)
Central Dental Ltd.
Centrix Incorporated
Champion Dental Products Inc.
Clinical Research Dental Supplies
Colgate-Palmolive Canada, Inc.
Coltene/Whaledent
Columbia Dentoform
Confectionery Manufacturers' Association of Canada
Confi-Dental Products
Cosmedent Inc.
Cottrell, Ltd.
Creative Play Environments Mfg.
Crosstex/Cross Country Paper Products
Custom Vacuum

◆ D ◆

Dansereau Health Products Inc.
Danville Engineering
DCI International
Dedeco International, Inc.
Degussa Canada Ltd.
Denerica Dental Corp. / Renfert GmbH
Den-Mat Corporation
Den-Tal-Ez Equipment
Den-Tal-Ez, Inc.
Dent-X
Dental Mac By Healthcare Communications
Dental Plus
Dentalaire Products International
Dentamerica
Dentatus AB
Dentaurum J.P.
Winkelstroeter KG
Dentech International

Dentona GmbH
Dentorium Export Ltd.
Dentsply Canada Ltd.
Designs For Vision, Inc.
Diadent Mfg. Inc.
Diatech Diamant AG Switzerland
DW Technology

◆ E ◆

E & D Dental Products
ECI Medical Technologies
Efos Inc.
Ellman International, Inc.
Encyclopaedia Britannica
Engle Dental Systems
Equinox Financial Group, Tom Williams
ESPE Dental-Medezin GmbH & Co. KG
Essential Dental Systems, Inc.
Excelco International, Inc.

◆ F ◆

Filhol Dental / Filpin Filpost Ltd.
Fine Arts Dental Laboratories Ltd.
Fischer Industries Inc.
Fittydent Altwirth & Schmitt GmbH
Forest Medical Products, Inc.
Friatec AG/Medical Devices Division

◆ G ◆

G. Hartzell & Son
GC America Inc.
Gendex/Midwest/Rinn Corp.
Genie Computer Systems Inc.
George Taub Products / Reliance Dental
Germany Official Participation
Gilbert's Dental Supplies Inc.
Goof Denmark

◆ H ◆

Hager & Meisinger GmbH
Harry J. Bosworth Company
Health Pro Group
Healthfirst Corporation
Healthgroup Financial Div. Newcourt Cred.
Henry Schein Inc.
Heraeus Kulzer GmbH
Herrco Enterprises Inc.
Higa Manufacturing Ltd.
Hoechst-Roussel Canada Inc.
Hu-Friedy Mfg. Co., Inc.
The Hygenic Corporation

◆ I ◆

I Contact Communications
Implant Innovations
Inland Dental Dist. Ltd.
Innovadent Technologies Ltd.
Insight Imaging Systems, Inc.
Institut Straumann AG
Ivoclar North America, Inc.

◆ J ◆

J. Morita Corporation
J.F. Jelenko & Co.
J.M. Ney Company International, The
Jeneric/Pentron
John O. Butler Company
Jordan AS
J.S. Dental Mfg. Inc.

◆ K ◆

Kaltenbach & Voight GmbH & Co. – Kavo –
Karl Hammacher GmbH
Kavo Elektrotechnisches Werk Leutkirch
Keeler Instruments Inc.
Kerr, A Subsidiary of Sybron Corporation
Kilgore International, Inc.
Knight Manufacturing Inc.
Knowell Therapeutic Technologies Inc.
Kodak Canada Inc.
KPMG Peat Marwick Thorne

Preliminary Exhibitor's List

FDI 1994

L

& R Manufacturing
Company
ctona/Universal Dental
Corporation
res Research
scod Spa
sedent Technologies Inc.
fecore Biomedical/
Oral Restorative
fe-Like
tema/Kentzler

M

&CC Cabinet Systems,
Ltd.
ada International Ltd.
arus Dental International
asel
atrx Medical Inc.
atsutani Seisakusho Co.,
Ltd.
axill Inc.
cNeil Consumer Products
Company
DT Corporation
L.D.T. Industrial Dental
Tools Inc.
edical Polymers
edi-Dent Services Inc.
edisporox - DVT - Ltd.
egadenta Ltd.
ercedes Dental Software
erck Frosst Vaccine Division
etelor
etasy Dental Products Inc.
files Inc. Dental Products
filtex Instrument
Company, Inc.
firage Dental Systems
fo-Dent Ltd.
obile Dental Equipment Corp.
(M-DEC)
moore Pemaco
osby Times Mirror
Professional Publishing
oyco Union Broach
ydea Marketing Inc.
yo-Tronics, Inc.

N

Nakanishi Dental Mfg. Co. Ltd.
Napa Dental Products
National Biological Labs, Inc.
Nephron Corp.
New Image Industries
New Technology Instruments
Nobelpharma

O

Omni Tech Inc./Germiphene
OMS - Otho-mix Supplies Inc.
Op-D-Op Visor Shields
Oral Logic Inc.
Oral-B Laboratories
Ortho Arch Co. Inc.
Oxyfresh

P

Panoramic Corporation
Pascal Company Inc.
Patterson Dental/
Dentaire Canada Inc.
Periodontal Health
Brush Inc.
Pharmascience Inc.
Phase Change
Planmea Oy
Polaroid Canada Inc.
Precise Dental
Premier International
Premier/Espe - Premier
Canada Inc.
Prestige Medical
Pride Institute
Pro Dentec Canada
Procter and Gamble
Professional Practice
Builders, Inc.
Professional Practice
Sales Ltd.
Pulpdent Corporation

Q

Quality Aspirators
Quattrotri SRL
Quintessence Publishing
Company Inc.

R

Regam Medical Systems
(Div. Bytech Ltd.)
Ribbond, Inc.
Richmond Dental Company
Ritter Dental Equipment Inc.
Ritter GmbH
Dentaleinrichtungen
Rocky Mountain
Orthodontics
Roeko Roescheisen GmbH
& Co.
Royal Bank of Canada
Royal Dental Manufacturing
Inc.

S

Safeskin Corporation
Sci-Can A Div. of Lux &
Zwingenberger
Septodont, Inc.
Shaw Laboratories Ltd.
Shinhung Co., Ltd.
Shofu Dental
Corporation
Siemens Aktiengesellschaft
Medical Eng.
Sinclair Dental Co. Ltd.
Smilemakers Inc.
SmithKline Beecham
Pharma Inc.
Sofraced
Soredex Medical
Systems
Southern Dental
Industries
Specialty Medco Inc.
SS White Burs Inc.
Star Dental
Stelte Company Inc.
Steri-Oss
Sultan Chemists Inc.
Sultan Group
Sunrise Technologies, Inc.
Svenska Dental
Instrument AB
Syntex Laboratories, Inc.

T

Teledyne Water Pik
Canada
Temrex Corporation

Texceed Corporation /
Obtura
Thompson Dental Mfg.
Tri Hawk Corporation
Troll Plastics Inc.
Trophy Radiology
Tuttnauer Co. Ltd.

U

U.N.I.D.I. National Union of
Italian Dental Industries
Ultracam
Ultradent Products Inc.
Unident Limited
Unilever Research
USDI

V

Van R/Clive Craig/Cadco
Viade Products Inc.
Vita Zahnfabrik - H. Rauter
GmbH & Co. KG
Vivadent

W

W & H Dentalwerk
Burmoos GmbH
Warner-Lambert
Canada Inc.
Warner-Lambert Canada Inc.
(Consumer Health Division)
Werther International SRL
Westan Dental Products
Group Ltd.
Williams (A Division of
Ivoclar N. Amer.)
Wright Dental Canada
Limited
Wrigley Canada Inc.

Y

Young Dental
Manufacturing Company

Z

Zest Anchors Inc.
Zhermack Spa
Zila Pharmaceuticals Inc.
Zirc Dental

Lectures & Symposia: Included with your enrolment to the Congress

- **The Role of Micro-organisms in Periodontitis**
Jean-Pierre Ouhayoun (France)
- **New Diagnostic Tools**
Roy Page (U.S.A.)
- **Treatment Modality Update**
Mariano Sanz-Alonzo (Spain)
- **Fluorides — What's New?**
Stephen H.Y. Wei (Hong Kong)
- **Anti-Plaque Agents and Antimicrobial Agents — Clinical Applications**
Philip Marsh (United Kingdom)
- **Infection Control — The Current Global Status**
Jens Pindborg (Denmark)
- **Occupational Infectious Disease and the Challenge of Infection Control**
John Molinari (U.S.A.)
- **Quality Assurance in Patient Care, Choosing Products and Recommending Procedures**
Martin Addy (Wales)
- **Role of ADA Product Evaluation Programs**
Kenneth Burrell (U.S.A.)
- **Assuring Quality of Dental Health by Obtaining Equivalency of Dental Diplomas**
Pierre Colombet (France)
- **Quality Assurance — The Role of the FDI**
Erik D. Olsen (U.S.A.)
- **The New Business of Dentistry**
James Pride (U.S.A.)
- **The Un(Happy) Complete Denture Patient**
Glen McGivney (U.S.A.)
- **Prosthetic Aspects of Osseointegrated Implants**
George Zarb (Canada)
- **What's Old... What's New... What's Tried... What's True... New Instruments for Dental Professionals**
Sherry Burns (U.S.A.)
- **Current Concepts on Oral Precancer**
Jens Pindborg (Denmark)
- **Early Orthodontic Management of Significant Skeletal Discrepancies**
Donald Joondeph (U.S.A.)
- **CAD/CAM for Dental Restorations**
Diane Rekow (U.S.A.)
- **Ethics and Professionalism in a Revolutionary Age**
Muriel J. Bebeau (U.S.A.)
- **Acute Dental Emergencies**
Raymond S. Greenfield (Canada)

- **Facial Imaging**
Gerald Wittenberg (Canada)
- **Total Patient Care in Pediatric Dentistry**
Stephen H.Y. Wei (Hong Kong)
- **Diseases of the Tongue — a Clinical Overview**
Isaac Van Der Waal (The Netherlands)
- **The Use of Biomaterials as Bone Substitutes in Periodontology and Implantology**
Jean-Pierre Ouhayoun (France)
- **Vasopressors and Heart Disease**
Stanley Malamed (U.S.A.)
- **Early Diagnosis and Treatment of Precancerous Lesions**
Isaac Van Der Waal (The Netherlands)
- **Employee Satisfaction — What Makes a Great Dental Team**
James Pride (U.S.A.)
- **Involving your Staff in Patient Communication**
Jennifer de St-Georges (U.S.A.)
- **The Missing Link in Dentistry**
Walter Hailey (U.S.A.)
- **Dental Hygiene — Recall Redefined**
Annette Linder (U.S.A.)
- **Understanding Procedures and Economics of Infection Control**
John Molinari (U.S.A.)
- **Update on Infectious Disease in Dentistry**
Sol Silverman Jr. (U.S.A.)
- **Temporary Fixed Partial Denture Restoration**
Pierre Boudrias (Canada)
- **The Wonderful World of Glass Ionomer Cements**
Graham Mount (Australia)
- **Bleaching and Porcelain Laminate — The Natural Combination**
Ronald Feinman (U.S.A.)
- **Ecological Approaches for the Control of Dental Plaque**
Philip Marsh (United Kingdom)
- **Theory of Computerization**
Ted De Vries (Canada)
- **Update on Premalignant Lesions and Oral Cancer**
Sol Silverman Jr. (U.S.A.)
- **The Spark of Erosion Technique (Procera) — Clinical Applications in Conventional and Implant Dentistry**
Pierre Boudrias (Canada)

- **Everything New is Old Again**
Dennis C. Smith (Canada)
- **Restorative Prosthodontics — Techniques for Improved Esthetics and Function**
Craig K. Naylor (Canada)
- **Biocompatibility of Dental Materials**
Dennis Smith (Canada)
- **Does Bonding Survive?**
Karl-Johan Soderholm (Sweden)
- **Caries Inhibition by Xylitol Chewing Gum**
Jason Tanzer (U.S.A.)
- **The Action of Xylitol on Mutans Streptococci — Is There Any Clinical Significance in Preventive Dentistry**
Luc Trahan (Canada)
- **Xylitol Programs in Child Populations with Advanced Untreated Caries**
K. Mäkinen (USA)
- **Creating a Patient-Centered Practice by Developing a Solid Patient-Practice Relationship**
Jennifer St.-Georges (U.S.A.)
- **The Oral Management of Cancer Patients**
Joel Epstein (Canada)
- **Bruxism — Controversy and Therapeutic Techniques**
Gilles Lavigne (Canada)
- **Removable Partial Denture — The Future**
Claude Lamarche (Canada)
- **Construction Without Destruction — Clinical Consequences of Porcelain Bonded to Tooth Structure**
Sverker Toreskog (Sweden)
- **WHO Program — Delivery of Oral Health Care**
- **Focus on Tax Planning for the Future**
Thomas H. Olson (Canada)
- **Cosmetic Dentistry/Cosmetic Imaging — "New Vistas in Communication"**
Ken Neuman (Canada)
- **Infant Dental Care**
Stephen Moss (U.S.A.)
- **Traumatic Injuries of the Trigeminal Nerve — Causes, Diagnosis, Treatment and Prevention**
Domenico Morielli (Canada)
- **Why Does Complete Denture Treatment Fail?**
Claude Lamarche (Canada)
- **Aesthetic Dentistry — Bonding with Composites and Ceramics**
James Dunn (U.S.A.)

SCIENTIFIC PROGRAM



- **Different Types of Lasers and Their Use**
Terry Myers (U.S.A.)
- **Mechanism of Cardiovascular and Neuroendocrine Responses During Stress in Different Types of Dental Treatment**
H.S. Braud (The Netherlands)
- **Malocclusions**
Donald Woodside (Canada)
- **Recent Prosthetic Advances in Osseointegration**
Torsten Jemt (Sweden)
- **In Vivo/In Vitro Evaluations of Dental Composites**
Karl-Johan Soderholm (Sweden)
- **Medical Emergencies: Is Trouble Coming?**
L. Abraham-Impijn (The Netherlands)
- **Medical Emergencies in the Dental Office — How to Handle it**
Yuzuru Kaneko (Japan)
- **Caries Risk Assessment**
J.D.B. Featherstone (U.S.A.)
- **Practical Use of Fluorides for Caries Control**
George K. Stookey (U.S.A.)
- **Guided Tissue Regeneration — Absorbable vs. Nonresorbable Membranes**
Roland M. Meffert (U.S.A.)
- **A New Era of Patient Education and Case Acceptance**
Anita Jupp (Canada)
- **Biomaterials and Restorative Dentistry Techniques**
Denis Robert (Canada)
- **A Technique and Management Approach to Restorative and Esthetic Dentistry**
Michael Goldfogel and Allen Kincheloe (U.S.A.)
- **The Success of Oral Appliances in the Treatment of Sleep Apnea and Snoring**
L.W. Halstrom and A. Lowe (Canada)
- **Oral Surgery for the General Practitioner**
Peter Reichart (Germany)
- **Change — An Essential Part of Practice Growth**
Anita Jupp (Canada)
- **The Cast Gold Restoration in General Practice**
Richard V. Tucker (U.S.A.)
- **Infection Control in Dentistry — 1994**
James A. Cottone (U.S.A.)

The preliminary scientific program is subject to change as other lectures are added.

Hands-on Courses

An opportunity to handle material, equipment and instruments while practicing new techniques under the supervision of an expert (Limited attendance)

- **Removable Partial Denture**
Glen McGivney (U.S.A.)
- **Isn't it About Time to Get on the Cutting Edge?**
Sherry Burns and Nancy Knispel (U.S.A.)
- **Dental Radiography**
Pat Robertson et al (Canada)
- **Root Planing and Scaling**
Herbert I. Bader (U.S.A.)
- **Cardio-pulmonary Resuscitation**
St. John's Ambulance (Canada)
- **Computers — Up Close and Personal**
Ted De Vries (Canada)
- **Endodontics for the 90's — Flare, File, Fill**
Howard Martin (U.S.A.)
- **How to Choose and How to Use the Newest Curettes — Periodontal Instrumentation Workshop**
Sherry Burns and Nancy Knispel (U.S.A.)
- **Esthetic Dentistry 1994**
Michael Goldfogel and Allen Kincheloe (U.S.A.)
- **Dental Electrosurgery for the 90's**
Jeffrey Sherman (U.S.A.)
- **Dental Materials for Dental Assistants**
Alan Boghosian (U.S.A.)
- **Recent Prosthetic Advances in Osseointegration Ad Modum Branemark**
Torsten Jemt (Sweden)
- **Provisional Restorations — Two User Friendly Restorative Techniques**
Keith Rossein (U.S.A.)

Limited Attendance Courses

Benefit from sustained lecturing, discuss different treatment procedures and thoroughly review specific cases.

- **Pain and Fear and the Future of Dentistry**
Stanley Malamed (U.S.A.)
- **Aesthetic Restorative Procedures, How, When and Why**
Ronald Feinman (U.S.A.)
- **Recession Proof your Practice — Strategies for Minimizing the Effects of Economic Downturn**
Clyde L. Schultz (U.S.A.)
- **Aesthetic Restorative Dentistry and Materials Update**
Terry Donovan (U.S.A.)
- **Periodontics for the 1990's and Beyond**
Roy Page (U.S.A.)

Live Television Presentations

View live demonstrations via giant screen TV plus get an opportunity to ask questions as the clinician performs procedures on patients.

- **Osseointegrated Implants for the Partially Edentulous Patient**
Peter Stevenson-Moore (Canada)
- **Porcelain Veneering Made Easy**
Terry Donovan (U.S.A.)
- **Guided Tissue Regeneration**
- **Hand and Powered Root Instrumentation**
Herbert I. Bader
- **Chairside Tooth Preparation for Veneer Onlays**
Werner H. Mormann (Switzerland)



Glen McGivney (USA)

"Removable Partial Denture"

MONDAY, OCTOBER 3

— All-day participation course, presented in English —

This hands-on course is necessary to fabricate the skills necessary to fabricate removable partial prostheses.

The course will

1. The common
2. Treatment planning,
3. A systematic approach to design, and
4. Simulated intra-oral tooth preparation, surveyor use and actual design.

About the clinician

Glen P. McGivney completed his undergraduate education at the University of Montana and his dental and prosthodontics specialty education were at Northwestern University in Chicago. His entire professional career has been devoted to promoting and improving the quality of prosthodontics services provided by the profession to the public.

**SOLD OUT -
2ND COURSE OPENED:**
Speaker, date and time
to be confirmed



St. John Ambulance (Canada)

"Cardio-pulmonary Resuscitation"

TUESDAY, OCTOBER 4

— All-day participation course, presented in English —

Wednesday, October 5 (repeat)

Thursday, October 6 (repeat)

The C.P.R. Level 'C' course meets Canadian Heart Foundation standards. This five to six hour course is designed for Health Care Professionals. It offers one and two operator C.P.R. for the adult, as well as child and infant resuscitation and obstructed airway procedures for adult child and infant. Certification is recommended to be renewed yearly.

About the clinician

St. John Ambulance is a national, voluntary agency founded in Canada over 100 years ago. Its mission is to enable Canadians to improve their health, safety and quality of life by providing training and community service.



Alan Boghosian (USA)

"Dental Materials for Dental Assistants"

TUESDAY, OCTOBER 4

— A.M. participation course, presented in English —

The continuous use of dental materials have greatly contributed to the development and preservation of natural tooth structure today that were not deemed possible.

This lecture and participation course will discuss properties and allow for the hands-on mixing and manipulation of traditional and recently introduced dental materials. Participants will have the opportunity to handle several categories of dental materials including cements, impression materials and light cured restoratives. This course will emphasize techniques to maximize the physical properties of the material while allowing for modification of handling properties such as work and setting times.

About the clinician

Dr. Alan A. Boghosian is an Assistant Clinical Professor in the Division of Biological Materials at Northwestern University Dental School serving as Director of the Clinical Research Center. He maintains a private practice devoted primarily to restorative dentistry. Dr. Boghosian is an author of numerous publications and has lectured internationally on the subjects of dental materials and restorative procedures.

**SOLD OUT -
REPEAT TUESDAY,
OCT. 4 (P.M.)**



Pat Robertson et al (Canada)

"Dental Radiography"

TUESDAY, OCTOBER 4

— A.M. participation course, presented in English —

Are your patients getting the minimum exposure for dental radiography? This course will involve small group demonstrations and discussion on the following techniques: endodontic radiography and troubleshooting difficult film placements.

About the clinician

Pat Robertson received her diploma in Dental Hygiene from the University of British Columbia in 1973 and her Instructors Diploma in 1984. She completed the University of North Carolina Special Session in Dental Radiology in 1987 and her Bachelor of Dental Science degree from the University of British Columbia in 1994. Pat has taught Dental Radiology to Certified Dental Assisting and Dental Hygiene students since 1981.

**SOLD OUT -
REPEAT TUESDAY,
OCT. 4 (P.M.)**

Hands-on Courses



Herbert Bader (USA)

**"Root Planing and Scaling:
Evolution or Revolution"**

FRIDAY, OCTOBER 7

— A.M. participation course, presented in English —

The most difficult aspect of dentistry is scaling and root planing. This course will provide a in-depth use of ultrasonic instruments and the theory and practice of root planing. The latest in piezo electric instrumentation on a typodont.

The attendee will receive a complete overview of the field with an excellent skill enhancement opportunity to become familiar with the most current and exciting techniques.

About the clinician

Dr. Herbert Bader is a lecturer in Periodontology at the Harvard School of Dental Medicine in Boston, MA. He has published a number of articles and abstracts in the field of periodontal diagnosis and is actively involved in clinical research. Dr. Bader is a full-time practicing periodontist and maintains a busy practice in Massachusetts.



Sherry Burns & Nancy Knispel (USA)

**"Isn't It About Time to Get on the Cutting Edge?
The Care, Maintenance and Sharpening of
Periodontal Instruments"**

WEDNESDAY, OCTOBER 5

— A.M. participation course, presented in English —

This new and innovative course will have you sharpening your instruments with a mean higher precision. This new approach to instrument sharpening makes it easy to learn and to apply. A sharpening kit will be available for purchase.

This HALF DAY workshop includes lecture, demonstration and practice of instrument sharpening for sickle scalers and curettes. This new approach to instrument sharpening makes it easy to learn and to apply. A sharpening kit will be available for purchase.

About the clinicians

Ms. Burns is a Clinical Associate Professor of Dentistry, Department of Periodontics at the University of Missouri-Kansas City, and serves as an Educational Consultant to Hu-Friedy Manufacturing Company, Inc.

Nancy Knispel is the Supervisor of Sales Training at Hu-Friedy Manufacturing Company, Inc. She provides instrument training programs to dental professionals in the United States, Europe, and Latin America.



Howard Martin (USA)

**"Endodontics for the '90s —
Flare, File, Fill"**

WEDNESDAY, OCTOBER 5

— All-day participation course, presented in English —

This participation course will provide you with the experience in technological advancement in endodontics with the use of the Caviendo system and do more.

1. Utilizing ultrasonic instruments (Caviendo).
2. The warm lateral condensation technique (Endotec).
3. Control safe end K/H file and handle.

About the clinician

Howard Martin, D.M.D., Research Endodontist, V.A. Medical Center, Washington, D.C.; formerly Clinical Associate Professor, Georgetown University. Dr. Martin is the developer of the CAVIENDO, ENDOTEC, M SERIES ROOT CANAL INSTRUMENTS, and CONTROL SAFE END FILE/HEDSTROM & HANDLE.



Keith Rossein (USA)

**"Provisional Restorations:
Two User Friendly Restorative Techniques"**

WEDNESDAY, OCTOBER 5

— A.M. participation course, presented in English —

This is a hands-on course for participants with two restorative techniques that are used in everyday practice. Using the Press Form Technique, participants will construct an "embedded bridge" alternative to the traditional bridge.

In the second part, participants will construct high quality provisional bridges utilizing the Press Form Technique. This procedure will drastically reduce the amount of time needed to be scheduled for crown & bridge appointments and will minimize patient return-for-repair visits. All participants will leave with professional study models that are ideal for patient case presentation.

About the clinician

Dr. Keith Rossein has been in private practice for 23 years and is currently the Dental Director for Ellman International.



**Sherry Burns &
Nancy Knispel (USA)**

**"How to Choose and How to Use the
Newest Curettes – Periodontal
Instrumentation Workshop"**

WEDNESDAY, OCTOBER 5

— P.M. participation course, presented in English —

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**SOLD OUT -
REPEAT THURSDAY,
OCT. 6 (P.M.)**

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About the clinicians

Ms. Burns is a Clinical Associate Professor of Dentistry, Department of Periodontics at the University of Missouri-Kansas City, and serves as an Educational Consultant to Hu-Friedy Manufacturing Company, Inc.

Nancy Knispel is the Supervisor of Sales Training at Hu-Friedy Manufacturing Company, Inc. She provides instrument training programs to dental professionals in the United States, Europe, and Latin America.



Ted DeVries (Canada)

"Computers - Up Close and Personal"

THURSDAY, OCTOBER 6

— All-day participation course, presented in English —

This session wi
experience with
Demonstrations
popular window
management syst
the dental software will be explained and left for you to experiment with.

**SOLD OUT -
REPEAT WEDNESDAY,
OCT. 5 (ALL DAY)**

gain hands-on
computer solutions.
puter, the highly
complete dental
incorporated in

About the clinician

In 1993, Ted DeVries joined Exan, one of the leading forces in dental practice management software. Here he consolidated his years of management and computer related experience with hands-on work in the health care industry. Developing high tech software and managing a successful business has given him a unique balance of high tech theory with practical applications.



**Michael Goldfogel &
Allen Kincheloe (USA)**

"Esthetic Dentistry 1994"

THURSDAY, OCTOBER 6

— All-day participation course, presented in English —

This course is a
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**SOLD OUT -
2ND COURSE OPENED:
Speaker, date and time
to be confirmed**

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Topics to be included in this presentation are:

1. Most recent advances in esthetic materials,
2. Free hand veneering,
3. Diastema closure,
4. Porcelain veneers,
5. Masking discoloured teeth, and
6. Understanding of colour.

About the clinicians

Dr. Michael Goldfogel has worked extensively in the field of cosmetic and restorative resin systems. He has experience in both clinical application and research as well as consulting to a number of major dental manufactures. He has lectured to University and Professional audiences throughout the United States and Canada for the past 12 years.

Dr. Kincheloe graduated from the University of Texas Dental Branch of Houston in 1975. He has been involved in the evaluation of composite resin systems for over 15 years. Dr. Kincheloe has lectured throughout the United States, Canada and Europe on esthetics procedures.



Jeffrey Sherman (USA)

"Dental Electrosurgery for the 90's"

THURSDAY, OCTOBER 6

— A.M. participation course, presented in English —

Electrosurgical t
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**SOLD OUT -
REPEAT THURSDAY,
OCT. 6 (P.M.)**

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This course includes a complete discussion and demonstration of a electrosurgical cutting, coagulation, and fulguration modes on the late electrosurgical equipment. The participants will have the opportunity practice the various types of procedures including frenectomy, open cullectomy, crown preparation and biopsy under the supervision of the clinician.

About the clinician

Dr. Sherman has been closely involved with the research and development of electrosurgery in the dental profession. He is a highly respected lecturer at major dental meetings and schools, nationally and internationally.



Peter Stevenson-Moore (Canada)

"Osseointegrated Implants for the Partially Edentulous Patient"

WEDNESDAY, OCTOBER 5

— A.M. presentation in English —

Simultaneous interpretation into French,
German and Spanish

Due to the overwhelming success of osseointegrated implants in edentulous patients it seemed only reasonable to apply osseointegration to the partially edentulous patient population as well. One major concern was that of esthetics, the ability to fabricate restorations which appear as natural teeth emerging through the mucosa. This live television presentation will demonstrate on a patient the implant components, techniques, and surgical/restorative interactions in order to achieve successful esthetic restorations for the partially edentulous patient.



Terry Donovan (USA)

"Porcelain Veneering Made Easy"

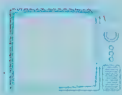
WEDNESDAY, OCTOBER 5

— P.M. presentation in English —

Simultaneous interpretation into French,
German and Spanish

The popularity of porcelain veneers in the dental office is ever increasing due to patient awareness and demand. If success is to be achieved in creating porcelain veneers that truly reflect natural teeth, the dentist and the other members of the dental team must coordinate their efforts. This live television presentation will show all procedures leading to a successful preparation of porcelain veneers. All steps including treatment planning, tooth preparation, taking of impressions as well as cementation will be demonstrated live on a patient.

Live television presentations will constitute a vital part of the Congress. General practitioners will benefit from illustrations by skilled clinicians demonstrating new techniques and diverse procedures. Demonstrations will be shown live via giant screen TV. Participants will have an opportunity to ask questions to the clinician as he performs procedures on patients.



Jennifer Coté (Canada)

"Guided Tissue Regeneration"

THURSDAY, OCTOBER 6

— A.M. presentation in English —

Simultaneous interpretation into French,
German, Japanese and Spanish

Guided tissue regeneration offers the clinician a technique which has the potential to restore supporting tissues lost as a result of periodontal diseases. The technique relies on the use of physical barriers to exclude gingival epithelium and connective tissue from healing wound.

The demonstration will clearly show flap design, incisions, defect and root debridement and membrane placement. We will demonstrate adaptation and wound closure. Post-operative instructions and time for membrane removal will be discussed.



Werner Mormann (Switzerland)

"Computer-aided Direct Ceramic Restorations"

THURSDAY, OCTOBER 6

— Noon presentation in English —

Simultaneous interpretation into French,
German, Japanese and Spanish

The clinician will perform a restorative procedure on a live patient using a chair-side computer-aided design and manufacturing technique for producing ceramic inlays, onlays and veneer laminates. Additional presentation, reservation on-site.



Herbert Bader (USA)

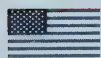
**"Hand and Powered Root Instrumentation:
The Heart and Soul of Periodontal Therapy"**

THURSDAY, OCTOBER 6

— P.M. presentation in English —

Simultaneous interpretation into French,
German, Japanese and Spanish

Successful management of the periodontal patient begins and ends with control of the root surface environment. This program addresses that issue with benchtop and live patient demonstration of the most current techniques and instruments to achieve a root surface compatible with biologic health. The attendee will become familiar with the new generation of hand instruments and ultrasonic systems, including a discussion and demonstration of the effects of antimicrobial lavage with ultrasonic scalers.



Clyde Schultz (USA)

"Recession Proof Your Practice: Strategies for Minimizing the Effects of Economic Downturn"

SUNDAY, OCTOBER 2

— All-day lecture, presented in English —

The objective of this program is to teach survival strategies for hard times. This includes advice on what to do and not to do in your office, with emphasis on positive techniques and effective strategies for dealing with patients, insurance problems, and communication with your staff.

About the clinician

Clyde L. Schultz, D.D.S. graduated in 1976 from the School of Dentistry, University of California at San Francisco. He has become one of dentistry's most respected authorities on chairside communication for professionals. He has lectured for universities and various private groups throughout the United States, Canada, and Europe.



Ronald Feinman (USA) & Ami Smidt (Israel)

"Aesthetic Restorative Procedures, How, When and Why?"

SUNDAY, OCTOBER 2

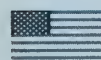
— All-day lecture, presented in English —

This program will broaden the dentist's horizon in practicing dentistry as it explores a complete gamut of restorative dentistry today. Subjects include: porcelain veneers, bleaching teeth (office and home), direct and indirect composite systems, glass ionomers and cements, current retraction techniques, resin-bonded bridges and cosmetic tissue relationships. Eliminate the confusion by learning what, when, where and how to use.

About the clinicians

Dr. Ronald A. Feinman has written numerous articles, lectured extensively, contributed to textbooks in esthetics and materials and is a consultant to dentistry. He maintains a general and cosmetic practice in Atlanta, Georgia.

Dr. Ami Smidt earned his DMD degree at Jerusalem's Hebrew University in 1986. He obtained his M.Sc. degree with distinction in Oral Microbiology in 1988. Dr. Smidt has given many lectures related to orthodontics as an adjunct for higher aesthetic results in Oral Rehabilitation.



Roy Page (USA)

"Periodontics for the 1990's and Beyond"

MONDAY, OCTOBER 3

— All-day lecture, presented in English —

The goal of this program is to summarize the major developments that have occurred in periodontics and periodontology over the past decade, and to project developments likely to occur in the immediate future. New approaches to treatment of the various kinds of periodontitis will be described and illustrated.

About the clinician

Professor of Periodontics, School of Dentistry, and Professor of Pathology, School of Medicine, Director of the Research Center in Oral Biology, and Director of the Regional Clinical Dental Research Center at the University of Washington Health Sciences Center.



Stanley Malamed (USA)

"Pain and Fear and the Future of Dentistry"

SUNDAY, OCTOBER 2

— All-day lecture, presented in English —

The management of pain and anxiety form the backbone of contemporary dental practice. The past decades have seen the introduction of a significant number of promising new techniques, drugs and equipment designed to aid the dental professional in a quest for a more pain-free and fear-free dental practice. In this program, the lecturer will discuss these advances, with an eye towards their possible applications in dentistry. Included will be a discussion of the relatively new technique of electronic dental anesthesia (EDA).

About the clinician

Dr. Malamed graduated from the New York University College of Dentistry in 1969. He then completed a dental internship and residency in anesthesiology at Montefiore Hospital and Medical Center. In 1973, Dr. Malamed joined the faculty of the University of Southern California School of Dentistry where today he is Professor and Chair of the Section of Anesthesia & Medicine.



Terry Donovan (USA)

"Aesthetic Restorative Dentistry and Materials Update"

MONDAY, OCTOBER 3

— All-day lecture, presented in English —

There is a host of options for the contemporary dentist in treating patients interested in esthetic dentistry. Many of these are less invasive than many of our conventional restorative therapies.

This presentation will delineate the procedures necessary for success with conventional and contemporary adhesive restorative dentistry. Many of the newer products will be evaluated and compared; emphasis will be on clinical product manipulation. Topics to be covered include: Effective gingival displacement; Impression materials: techniques for use; Solutions for fractured porcelain; bleaching, enamel microabrasion; bonded porcelain (veneers, crowns, inlays, onlays).

About the clinician

Dr. Terry Donovan received his D.D.S. from the University of Alberta in 1976. He has published extensively, and has lectured world wide on the topics of restorative dentistry and materials science. He is currently chairman of the American Dental Association's Council on Dental Materials, Instruments, and Equipment.

All-day Limited Attendance Courses allow the speaker to spend more time on antecedents, discuss different treatment procedures and thoroughly review specific cases. The participants benefit immensely from this sustained lecturing in a single field of dentistry. The number of participants will be restricted by room capacity.

FDI '94 Pre and Post Congress Tours

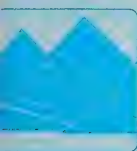


ALASKA (September 24 - October 1, 1994)



A memorable 7 night cruise to Alaska aboard Holland America's M.S. Westerdam. Heading up the inside passage, enjoy many delightful ports of Ketchikan (Alaska's first city), Juneau (Alaska's capital) and Glacier Bay (where the mighty glaciers will take your breath away!). A trip of a lifetime!

CANADIAN ROCKY MOUNTAINS (October 8 - 11, 1994)



See the wonders of the Canadian Rocky Mountains on this 4 day/3 night train and bus excursion. Travel through spectacular scenery during the day and enjoy comfortable hotel accommodations at night. You will see a wide variety of wildlife and natural attractions that Alberta and British Columbia have to offer; including the wonderful destinations of Jasper, Banff and Lake Louise.

HAWAII (October 7 - 14, 1994)



Enjoy a fabulous 8 day/7 night vacation in Hawaii on the island of Oahu. You can stay at the Hilton Hawaiian Village or at the Pacific Beach Hotel, both situated on the beautiful Waikiki beach. A perfect tour for those wishing to relax and enjoy the magnificent view of Hawaii.

LOS ANGELES (October 10 - 13, 1994)



Enjoy a marvelous 4 day/3 night cruise aboard Holland America's M.S. Westerdam from Vancouver to Los Angeles along the Canadian and U.S. coast. Since the cruise departs on October 10th, this is the perfect tour for those wishing to do some post-conference sightseeing in Vancouver.

AUSTRALIA AND NEW ZEALAND (October 7 - 21, 1994)



An incredible 15 day/14 night post-conference tour "down-under". In Australia, visit Cairns, the great Barrier Reef, the rain forests, Sydney, the Blue Mountains and go on a wine tour. In New Zealand, see the Coromandel Peninsula and Rotorua thermal springs. You will also have the opportunity to stay either on a sheep, kiwi fruit or cattle farm for two nights. Each farm will host 2 couples from our group – a sure way to enjoy local New Zealand hospitality. From here, optional stopovers for 4 days/3 nights in either Fiji or Hawaii.

For more detailed information,
contact the FDI 1994 Organizing Committee
at 1-800-267-6354 by telephone or at (613) 523-3062 by fax.

Finding the Right Practice Set-up Doesn't Have to Be a Chore



That's right. ExperDent Consultants Inc. has a pool of practices which are interested in bringing aboard associates. Ultimately, some will be looking for full partnership arrangements, some will be seeking buy-ins; presently, all are offering tremendous opportunities for professional growth.

Below you'll find but a sampling of the practices we represent. For information about these – and the other opportunities we are privy to – please contact Nickola at (604) 278-5059 or Russell at (905) 415-9767.

-  **White Rock, B.C.** (Vancouver) Owner dentist is seeking an associate who is keen on refining their skills and assuming responsibility for a dedicated team and solid patient base
-  **Coquitlam B.C.** (Vancouver) Owner dentist with an established patient base and team is looking for an associate who has buy-in as ultimate goal
-  **Vancouver, B.C.** Motivated, business-minded associate with buy-in ambition wanted for well-established, hygiene-oriented practice
-  **Smithers, B.C.** Progressive practice – which can't keep up with patient needs – is offering a tremendous opportunity for a career-minded individual
-  **Comox, B.C.** Great opportunity for a motivated, career-minded individual looking to work in a progressive, hygiene-driven practice on Vancouver Island
-  **Edmonton, Alberta** Entrepreneurial associate sought for a highly computerized, progressive practice with an excellent hygiene program
-  **South St. Marie, Ontario** Busy, growing, hygiene-driven practice is looking for an associate with experience and management ambitions
-  **Northern Ontario** (small town) Retiring senior dentist of a progressive, extremely busy practice is looking for someone to step in and continue to meet the needs of his established patient base
-  **Northern Ontario** (urban)
 - 1) Super opportunity for an experienced practitioner to control their own future
 - 2) Great team to help a new grad get busy quickly (longterm commitment)
-  **Bay of Quinte, Ontario** Great future for a new grad in a relaxed, lovely lakeside spot
-  **Frankford, Ontario** Career opportunities for two associates in a progressive, thriving practice and/or satellite practice

#80-10551 Shellbridge Way, Richmond, BC, V6X 2W9

Telephone: (604)278-5059 / Fax: (604)278-1406

#705-7030 Woodbine Ave., Markham, Ont., Canada L3R 6G2

Telephone: (905)415-9767 / Fax: (905)475-4082

ExperDentTM



ENDODONTICS



The Importance of Endodontic Access in Locating Maxillary and Mandibular Molar Canals

W.H. Christie, DMD, MS, FRCD(C)

G.K. Thompson, DMD

ABSTRACT

The principle of straight-line access is discussed with particular reference to endodontic access of either maxillary or mandibular molar teeth. Modifications to the traditional triangular access opening are described that will make it easier for a practitioner to locate and instrument the fourth canal system commonly found in molar teeth. The high frequency of a fourth canal in molar teeth makes it essential to anticipate and find all canals during molar endodontic therapy. Quite frequently, the general practitioner attempting molar endodontic therapy should expect to locate a second canal in the mesiobuccal root of the maxillary molar and a second canal in the distal root of a mandibular molar. The possibility of extra roots over and above the norm should also be anticipated and looked for carefully. Proper angulation and interpretation of radiographs help to identify chamber and root anatomy.

A two-step access opening is advocated when making access openings on molar teeth if a coronal crack in the crown is to be seen early in treatment. A method of unroofing the pulp chamber and

pre-flaring the canal orifice to facilitate the subsequent shaping of the entire root-canal system is described. Clinical and laboratory examples are pictured to illustrate modifications or errors in the standard endodontic access opening.

SOMMAIRE

Dans cet article, on expose le principe de l'accès rectiligne en faisant particulièrement référence à l'accès endodontique aux molaires supérieures et inférieures. On y décrit les modifications apportées à la technique habituelle de l'accès triangulaire, modifications qui permettent au praticien de localiser et d'instrumenter plus facilement le quatrième système radiculaire dont sont dotées ordinairement les molaires. Aussi, lors d'une thérapie endodontique, doit-on s'attendre à trouver ce quatrième système. Assez souvent, le praticien général qui effectue cette thérapie doit s'attendre à trouver un deuxième canal dans la racine mésio-vestibulaire d'une molaire supérieure et dans la racine distale d'une molaire inférieure. Il est possible aussi que le nombre des racines dépasse la norme; c'est un point qu'il convient de surveiller. Une bonne angulation et une

bonne interprétation des radiographies aident à déterminer l'anatomie de la cavité et des racines.

Introduction

Predictably successful endodontic treatment is dependent on following the basic principles of: access, cleansing and shaping, and obturation of the entire root-canal system. These principles have evolved from clinical concepts established through clinical practice and basic research. Of the three, perhaps the most important is the principle of "straight-line" access. It should be remembered that the ultimate objective of endodontic access is to provide direct access to the apical foramen, and not merely to locate the canal orifice.

Our concept of what constitutes straight-line access to the root-canal system has evolved slightly over the years. The ideal access cavity is a dynamic entity, and may be changed as circumstances dictate. With small modifications to technique and careful attention to detail, each endodontic access opening may be improved on during endodontic treatment.

Attention to detail is most important when the practitioner is estab-

JOURNAL

June/
Juin
1994
Vol. 60
No. 6

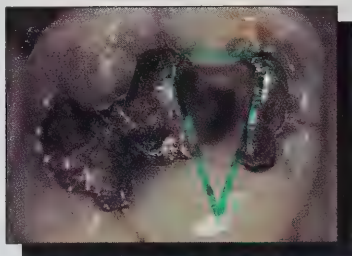


Fig. 1: The traditional triangular access opening is often too small and results in an endodontic access that is too confined to show the orifice of all canals on a typical maxillary molar. Debris from an overhanging amalgam may also be carried into the canal system.

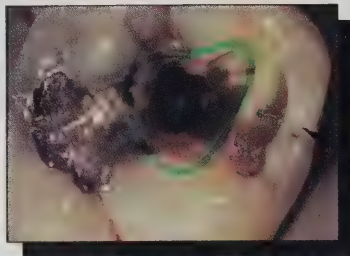


Fig. 2: Amalgam was removed and the access outline was made more ovoid on this laboratory example. A crack over the mesial marginal ridge, as well as down to the floor of the chamber, may now be seen better.

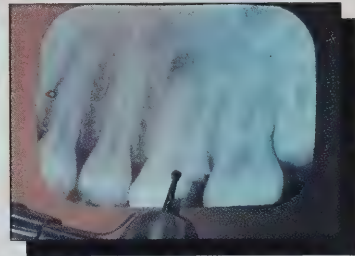


Fig. 3: The shaft of the high-speed bur is used to approximate the size and depth of the chamber before penetration is made on an endodontic access opening.

lishing endodontic access to the posterior root-canal systems of multi-rooted teeth. Straight-line access must allow the operator to locate all canals, to help in proper cleansing and shaping and, ultimately, to facilitate the obturation of the canal system. On the other hand, the conservation of tooth structure must provide for sufficient remaining dentin to allow the practitioner to successfully restore the tooth after endodontic therapy.

This article will look at current concepts in establishing access to both the maxillary and mandibular molar root-canal systems.

An important requirement for the endodontic treatment of teeth in the posterior quadrants is the ability to see the floor of the chamber clearly — a requirement that texts printed 30 years ago did not seem to emphasize.^{1,2} In fact, access outline shapes from that time were typically depicted as being small and triangular. All that the texts stressed was establishing access to the three main root trunks. In the maxillary molar, a palatal root, a distobuccal root and a mesiobuccal root were pictured at the apex of each point of the triangle (**Fig. 1**). Similarly, in the mandibular molar, the triangle was oriented with the base over two mesial root canals, and the apex of the outline pointed to the distal canal orifice.

Although the number of roots visible on a periapical radiograph of molar teeth may seem to form a triad, the general anatomy of the root canal system is often much

more complex. With the following modifications to a molar endodontic access opening, many of these variations will be discovered, and the endodontic therapy will enjoy a higher chance of success.

Before access can be established, it is obviously important to make a diagnosis of the pulpal or periapical status of the molar tooth involved. After consultation with the patient, and if a treatment plan includes saving the tooth with endodontic therapy, the endodontic access opening may be started. It is assumed that rubber dam will be used in all instances. Visibility and all the other benefits of barrier control are improved when a well-placed rubber dam is used.³

Maxillary Molar Teeth Will Most Likely Have Four Canals

Many anatomical and clinical studies have shown that there is a higher frequency of two-root canal systems within the mesiobuccal root of the maxillary molar than was previously suspected.⁴ Weine et al were among the first to publish a paper on the clinical endodontic significance of locating and treating the second mesiobuccal canal.⁵ The incidence of a clinically-treatable double canal system in the first maxillary molar has recently been found to be over 72 per cent.⁶ Maxillary second molars still have a significant incidence of four-canal anatomy, although at a slightly lesser frequency.

A modified outline shape that could improve the chances of locating all canals is shown in the illustration of the laboratory model used here (**Fig. 2**). Essentially, the modified outline is more ovoid in shape. The roof of the chamber should therefore be opened more parallel to the mesial marginal ridge. There is a conflict between the ideal class-one occlusal preparation of operative dentistry, and the required endodontic access opening outline. Weller and Hartwell⁷ have also suggested a modification in the position of the maxillary molar access outline, so that it is centred more over the root trunk, which is the expected location of all canal orifices as well.

The authors will attempt to describe how this new outline shape should be developed, on the occlusal-cavosurface, into a continual tapering funnel-shape that will flow unimpeded into all the coronal portions of the root canal systems of molars. Particular attention should be paid to locating a fourth canal in the maxillary molar, if it exists clinically.⁸

Modified Endodontic Access Of The Mandibular Molar Teeth

The outline shape of the access opening on the mandibular molar has changed over the years, for reasons similar to those leading to changes in the outline shape for maxillary molar access. For many years, it has been realized that the mesial root of the mandibular mo-

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Fig. 4: A cracked tooth was suspected from the history and diagnosis during clinical treatment of this right maxillary molar. Before access penetration, the amalgam restoration was removed and a crack was found running over the distal marginal ridge and deep enough to the mesial to expose the pulp chamber.

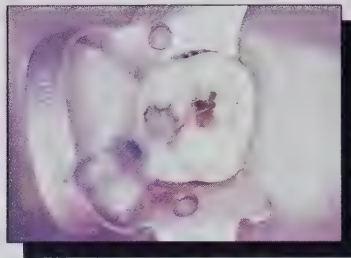


Fig. 5: The grooves on the floor of the chamber of this right maxillary first molar are visible on the buccal portion of the chamber. A fine Number 08 file is being teased down the fourth canal, which was detected just to the lingual side of the main mesiobuccal canal orifice.

lar, in the majority of cases, has a double root canal system that terminates in either a single or double apical foramen.⁴ For this reason, the endodontic outline shape should extend over both of these canal systems, so the endodontic instruments may enter the canals in an unimpeded fashion.

The variability of the root canal anatomy in the distal root may not be such common knowledge, however. Earlier texts referred to a single, large root canal in the distal root of mandibular molars. Although this configuration may be the most common finding, the incidence of a wide buccal-lingual canal is not infrequent. A distal root may even be so wide in the buccal-lingual dimension as to nearly mirror the morphology of the mesial root, with a double canal system and a single or double apical foramen.⁹ A third distolingual root in mandibular molar teeth, with an incidence ranging from 0.9 to 20 per cent in some populations, is also possible.¹⁰

These common variations in distal root anatomy may be identified through careful reading of well-angled radiographs. However, an extra root canal may not be discovered until the access opening has been completed, and it should therefore be anticipated beforehand. The modified endodontic access opening for a mandibular molar has changed from a triangle to a more trapezoidal shape to accommodate entry into the multiple

distal roots.¹¹ As mentioned earlier, the outline shape has its base over the mesial roots just distal to the mesial marginal ridge, and narrows to an ovoid shape just distal to the central pit area with an extension to the lingual just long enough to uncover a distal-lingual root orifice or multiple canal, if it exists.

Radiographs Are Essential In Judging Size Of Pulp Chambers

Before a bur is placed onto the occlusal surface of either the maxillary or mandibular molar requiring endodontic access, it is prudent to carefully scrutinize the diagnostic periapical radiograph for size and depth of the chamber, as well as the number, size and direction of the roots and root canals.¹² Biting radiographs are also a great benefit in estimating not only the size of the chamber, but also the distance from the occlusal plane to the roof of the chamber. A high-speed handpiece with a standard Number 4 round bur in place should be positioned over the occlusal plane of the radiograph (**Fig. 3**). The proximity of the furcation and the possibility of floor perforation is also seen in this way if the access opening is cut too deep. The next step in any access opening may be to remove all carious dentin and unsupported enamel, and to reduce weak or projecting cusps from occlusion. A crown that has been weakened by caries at-

tack may have to be pretreated with a cemented band.

In most cases, the crown of the molar in question has been restored previously with a large amalgam or a posterior composite restoration. If the restoration is still serviceable, these materials may be treated as normal tooth substance. There should not be a reluctance to remove interfering restorative material, however. Cutting and filing debris should never be allowed to migrate into the canal system if proper care is taken in the access stage.

Two Step Access Locates Coronal Fractures if Present

We have found a two-step access to be most helpful. The first step is to trace out the access outline with a bur, as visualized on the occlusal surface, to a depth below the restorative material or just through the dentinal-enamel junction. The approximate size and shape of the access opening is determined by the size and shape of the tooth at the cemento-enamel junction, as is the approximate outline shape for a maxillary or mandibular molar, as has been described earlier.

A Number 4 round bur seems the right size for access on most molar teeth. This first step of the preparation will result in a deep class-one type cavity. At this point, it is wise to stop and take a good look at the dried floor of the preparation. Incomplete coronal fracture lines, if they were suspected from the history or if they were not considered in the diagnosis, may be seen at this stage (**Fig. 4**).

The mandibular second molar, followed by the maxillary first molar and the mandibular first molar, are the teeth most likely to have vertical root fractures.¹³ A fibre optic light, used to illuminate the vestibular or lingual side of the crown, will sometimes help to make these craze lines visible. An access that penetrates too quickly into the chamber may miss a crack that is hidden by a large restoration. There are times when a gradually progressive crack penetrating into the chamber may be the etiology of

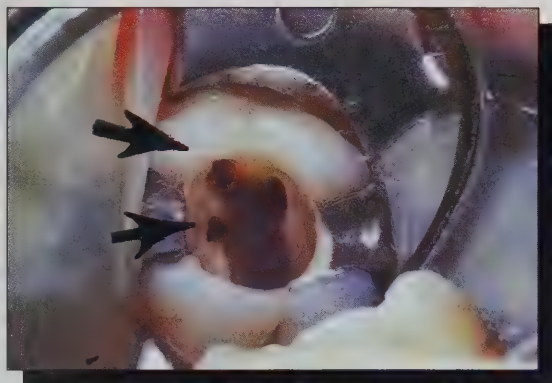


Fig. 6: The two orifices of the mesial canals of a left maxillary molar in this clinical example are more visible on the mesiobuccal floor after the Gates-Glidden bur has opened the orifice to the canal system.

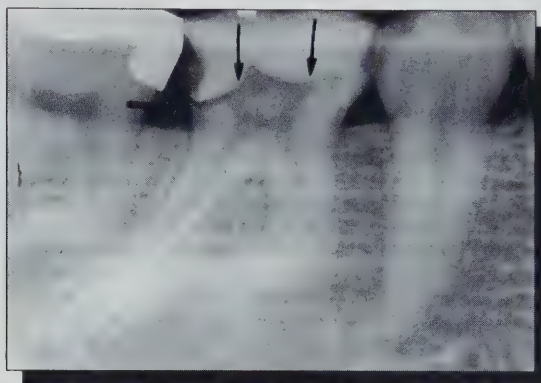


Fig. 7: A radiograph of a clinical example of an error in mandibular molar access opening shows that it has been prepared too shallow and has breached the pulp horns only (arrows). Also apparent is leakage on the distogingival margin because all carious dentin was not removed.

the pulpal pathology rather than caries penetration. Vertical fractures that progress deeper into the root trunk have a poor prognosis, and early detection is essential in these cases.¹⁴

Assuming that a transverse fracture is not found, then the second step of the access may be continued. On the maxillary molar, the penetration of the pulp chamber should first be directed toward the palatal root. On the mandibular molar, the direction of first penetration is usually from the central pit area toward the distal root. Once the roof of the chamber has been breached, the rest of the roof is removed to the same depth with the underside of the round bur in a vestibular or mesial direction, respectively, depending on the arch. The cavity outline is thus reduced and combined with the chamber walls. Final refinements can be made to the walls of the outline form using a tapered diamond with a flare to the occlusal cavosurface. The floor or the actual walls of the chamber must not be reduced, since this will weaken the dentin of the molar crown, which will be needed for a future restoration after the endodontic treatment.

All that remains is to rinse the access debris with copious volumes of dilute sodium hypochlorite. If there is pulp tissue still present and hemorrhage obscures the view, then a small spoon excavator with a long shank, such as the

Number 31 L, may be used to curette the floor over the canal orifice. Necrotic tissue and cutting debris can be loosened in a similar manner before a second rinse with irrigating solution. After suction of the excess fluid, the floor of the chamber, with its associated grooves, should now be seen.¹⁵ These grooves should be used like "a road map" to lead to the orifice of a canals (at the end of each groove)¹² (Figs. 5 and 11).

Identification and Direction Of All Canals Using Long Explorer On the Maxillary Molar

A long-shank endodontic explorer, such as the DG 16, is essential in probing the grooves on the floor of a maxillary molar and in detecting the orifice of the root canal systems. The palatal canal is usually the largest canal system in the maxillary molar. The direction of the coronal portion of the canal can be felt by inserting the explorer passively into the orifice. The incidence of double palatal roots is low, but must not be ignored if the chamber is wide on the palatal dimension.^{16,17} By following the groove in the floor to the vestibular direction, the distobuccal canal orifice will often be felt. Size and direction can be estimated in a like manner using the DG 16 endodontic explorer.

As has been mentioned before, the most complicated root canal system in the maxillary molar is found on the mesiobuccal root. When the grooves in the floor are followed to the mesial, a main mesiobuccal orifice is usually located under the mesiobuccal cusp tip and in a line directly under the point where the mesiobuccal pulp horn used to be located. Exploration of the size and direction of this canal with the DG 16 endodontic explorer will usually reveal a vertical or slight mesial direction to the coronal portion of the mesiobuccal canal. Once the main canal on this root is located, a careful search for the second canal orifice is necessary. The presence of a groove running to the palatal direction is often a good indicator of the location of the second mesiobuccal (MBu II) canal orifice. These canals are often so fine that the DG 16 explorer may not even stick. Probing with the explorer or scraping the calcification off of the floor in the region of the groove with a small spoon excavator is often necessary. Calcification and deposits of secondary dentin may have occurred due to either the presence of deep carious lesions or restorations on the mesial surface of the maxillary molar. On rare occasions, it may be necessary to carefully remove these calcifications from the floor or mesial wall with a small slow-speed long-shank half round bur. Care should be taken never to re-

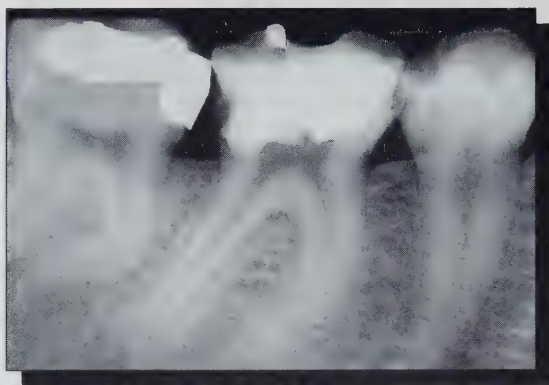


Fig. 8: The roof of the chamber from the previous example was removed and the remaining pulp tissue curetted. This treatment resulted in final resolution of the patient's symptoms, after three previous unsuccessful attempts at pulpectomy.

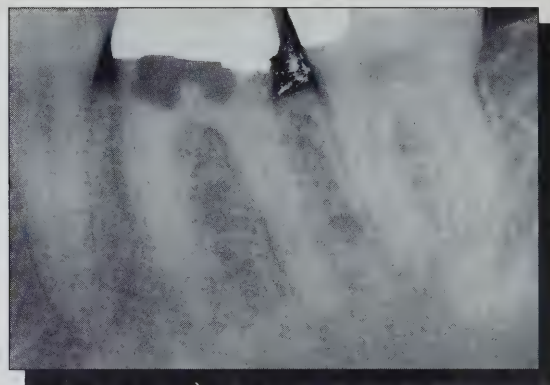


Fig. 9: This radiograph shows the effects of gouging during an attempted access opening of an excessively calcified chamber. A crown was placed a short time previously, and the pulp became symptomatic. Fortunately, there was no sign of perforation and all three canals could be located with the help of fibre-optic illumination.

move dentin in the direction of the furcation or in the region of the mesial gingival concavity. The mesiobuccal root trunk has its greatest diameter in the vestibular-palatal direction. If this root anatomy is taken into consideration, the opening into the second mesiobuccal canal should not weaken the root trunk or cause a perforation, though this may be a hazard with excessive use of rotary instruments.¹⁸

Second Mesiobuccal Canal Is Fine and Difficult To Negotiate

It may be necessary to irrigate with hypochlorite and dry the floor of the chamber with a fine suction tip several times in the search for the second mesiobuccal canal. Once the end of the groove or a pinpoint orifice on the floor of the chamber is located, a fine and flexible Number 08 file is teased into the canal system (**Fig. 5**). A back-stroke or coronal direction peripheral filing action will often remove calcification that is heaviest in the region of the canal orifice, and make negotiation deeper into the canal easier. Copious irrigation is necessary to help to float the filing debris away. The second mesiobuccal canal orifice may be located anywhere from a point adjacent to the main mesiobuccal canal back into the region of the palatal canal orifice. The direction of

the coronal portion of the canal is also variable, and depends on: the shape of the root trunk, the canal orifice on the floor, and whether the canal joins the main mesiobuccal canal or if it exits in a separate foramen. This fourth canal system is rarely round and is usually very much fin-shaped. Only a file that is flexible and fine, with a precurved tip, will be able to negotiate the broadest diameter of the fin. Care must be taken not to ledge or block the direction of the fine root canal system in this initial exploration procedure.

The other three canals should be carefully negotiated and the debris removed with suitable fine endodontic instruments in a like manner. When the size and direction of the canal orifice have been explored, it is often beneficial to improve access to the canals by opening and flaring the orifice. A Number 2 Gates-Glidden bur may be used, with caution, to no more than one half the bur-head length in the direction of the canal. This will help to flare a very small orifice diameter. These fine Number 2 Gates Glidden rotary instruments are approximately 0.6 mm in diameter, and will help to remove overhanging dentin and facilitate re-entry with files. A straighter access to the apical portion of the root should also help to prevent apical stripping and midroot perforation. Copious irrigation and careful re-

entry of the canal with the same fine file is now needed to remove debris a second time. The canal orifice can now be seen and entered more easily (**Fig. 6**).

The endodontic access opening of the maxillary molar is essentially finished with this step. Further modifications to the access, even if they are minor, are still possible but rarely needed. Overhanging amalgam or other obstructions that impeded file entry should have been removed from the cavo-surface. A bevel on this area also provides for resistance to intrusion of the temporary access seal. All canals should have been located and identified as to size and direction, and most of the degenerated canal contents removed, before the case is dried and sealed, or the instrumentation procedure is continued.

Size, Direction and Number of Canal Orifice Also Has To Be Determined On a Mandibular Molar

The two-step access opening for the mandibular molar, which is used to check for a crack in the root trunk, is similar to that described for a maxillary molar. After the chamber of the mandibular molar has been unroofed and the cavo-surface bevel has been placed in the coronal direction, the floor of the chamber should likewise be



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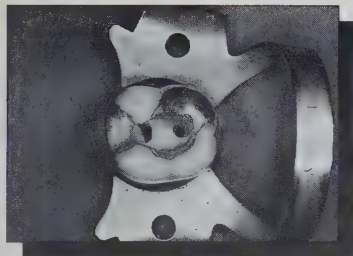


Fig. 10: A mandibular right molar is shown that had an access opening that was too shallow and only succeeded in opening through the mesial and distal pulp horns.

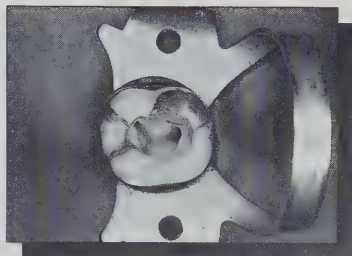


Fig. 11: The outline shape of the previous example has been modified, the overhanging amalgam has been removed, and grooves on the floor of the pulp chamber may now be seen to end in each respective canal orifice.

visible. Irrigation with sodium hypochlorite solution and curettage of the debris with a small 31L spoon excavator should remove cutting debris as well as pulpal remnants. The search to locate the orifice to the canals and determine their direction should follow the same principles as for the maxillary molar.

If the operator plans to start by locating the distal canals, the grooves on the floor of a mandibular molar may be seen to form either a "T" shape or an "H" shape. A "T" shape is indicative of a single distal canal (**Fig. 11**). Since the distal canal is often relatively large, tissue and debris can be broached and removed fairly easily with irrigation and endodontic instruments.

However, if the distal groove ends in an "H," then a buccal and lingual side to the canal system should be explored. The endodontic access may even have to be enlarged and extended to a square shape if a fourth distolingual canal is suspected from the radiograph. If the roof of the chamber has been removed properly, these fourth canals are often directly visible. The practitioner should now follow the grooves on the floor, in a mesial direction, to the ends of the mesiobuccal and mesiolingual canal orifice. A long-shank DG 16 endodontic explorer can be used to feel for these smaller mesial canals. Because of the curvature of the mesial roots, the canal system may first begin to curve in a mesial direction, and should be explored

from this direction under each respective mesial cusps.

Canal systems that are moderately curved on the mesial root of mandibular molars can be straightened judiciously with the careful use of orifice openers. The removal of overhanging dentin on the mesial side of the root trunk should be considered as an extension of the access opening. After the direction of the fine mesiobuccal and mesiolingual canal is determined, a slowly-rotating Number 2 short-shank Gates Glidden bur (Brasseler, Montreal, Quebec) may be used to no further than one-half the depth of the head in each orifice. This is known as pre-flaring, and will make the fine mesial canals easier to re-enter and flare in later operations in the canal system. Final irrigation and debridement with fine endodontic files short of the foramen is required to lift debris and tissue from all the canals that have been located. As has been described for the maxillary molar, the access opening stage is essentially complete, and the canals may be dried and medicated, or further instrumentation may continue.

The Ideal Size of Molar Access Openings

Before bringing our considerations of endodontic access on molar teeth to a close, a few general points on the size of the access opening and the avoidance of errors when opening into a root canal system should be listed. If calcification of the chamber or other factors make locating the canals too complicated for the general practitioner,

then the treatment should be referred to a specialist in endodontics.

The first error in judgement that may occur is in making an access that is too shallow. A practitioner's natural caution of the pulp cavity in cutting operative restorations may result in an access cavity that just opens through the prominent pulp horns (**Figs. 7 and 10**). The appearance of bleeding points or the feel of these pulp horns may be mistaken for a canal orifice (**Fig. 7**). This shallow access would result in pulp tissue that is entrapped under the remaining roof, and could result in a continuation of symptoms (**Fig. 8**). After the roof of the chamber is removed, the characteristic appearance of the chamber floor should be visible (**Fig. 11**).

The opposite condition could also occur if the access cavity is carried too deep. Without a careful tactile sense, the length of the bur may be overextended, and the floor of the chamber could be drilled away. Excess calcification of the pulp cavity may make it difficult to feel when the chamber has been reached (**Fig. 9**). Excellent depth perception and constant visual confirmation are needed at all times. The worst case scenario may result in a perforation of the furcation floor and possible failure of the treatment.

The natural tendency is to try to keep the access opening as small as possible. However, an access that is too small on the cavosurface will probably be under-cut as the chamber is reached. Not only will it be difficult to see directly into the floor of the chamber, but any temporary sealing restoration, placed between treatments, could be intruded on occlusion and the seal lost. The possibility of missing a canal orifice obscured by overhanging chamber roof has already been discussed.

On the opposite extreme, an excessively large access opening will waste root trunk dentin that is needed to ensure the strength of a subsequent restoration. Restorative material on the occlusal surface is expendable, but the supporting dentin should be retained, if possible. It is also prudent to reduce a





protruding cusp height in an attempt to prevent future fracture.

The last concern to be noted is the case of a malpositioned tooth requiring an access endodontic opening. The malalignment may be due to eruption path or crowding, or it may occur when a crown or restoration with a different occlusal table has been placed. Careful observation of the radiograph for this malalignment, combined with clinical periodontal probing to feel for root surfaces, are needed. The direction of the access opening may compensate for the differing location of the underlying pulp cavity.

When all these factors are taken into account, the endodontic access opening should allow the practitioner to see all the canals in a molar tooth, to clean and shape them efficiently, and then to place and seal the endodontic filling material as accurately as possible to the apical constriction. The endodontic access opening is truly the secret to successful endodontic treatment. ■

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makes a healthy difference

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Moving Your Way - Every Day

ENDODOXICS



A Clinical Appraisal of the Gonon Post-Pulling System

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ABSTRACT

Quite often during endodontic re-treatment, the practitioner is confronted with the problem of intra-radicular post removal. The aim of this paper is to present and evaluate the efficiency of the Gonon post-pulling system (Thomas extracteur de pivots, FFDMM-Pneumat, Bourge, France).

Introduction

The primary objective of endodontic treatment is to clean and shape the root canal system to eliminate the organic and inorganic contents that are, or might be, potentially toxic to the surrounding periodontium. This is inevitably followed by the hermetic obturation of the canal with a biologically-acceptable material to prevent any possible percolation.¹

In fact, these are the most basic requirements for endodontic success and the healing of periapical lesions of endodontic origin. Research and clinical experience have shown that the single factor accounting for the highest percentage of endodontic failures is a disregard, or even a mere deviation,

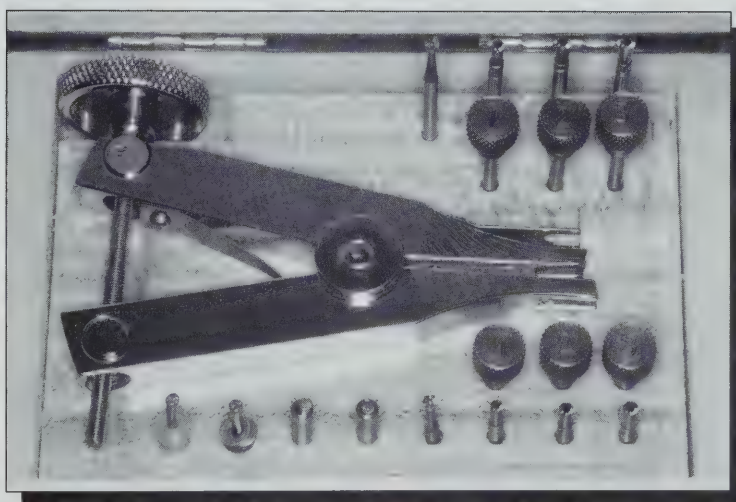


Fig. 1: The Gonon post-pulling system.

from the primary objective, as mentioned above.

Nowadays, there is general consensus among most endodontic authorities that the best choice for the re-treatment of endodontic failures, where feasible, is the non-surgical approach², because:

- a periapical surgery, consisting mainly of an apicoectomy and a periapical curettage cannot and will not, by any means, remove or isolate the primary etiologic cause of the failure, which is located inside the canal(s).

- even with the use of an apical retrograde obturation, it still remains impossible to seal all the lateral canals that act as potential portals of exit to the noxious canal contents.
- local anatomic structures like the mental foramen, the nasal fossae, the mandibular nerve, the thickness of the outer bony cortical plate, etc., are all factors that might contra-indicate any surgical intervention in these regions³.
- some systemic diseases of the patient might render endodontic

JOURNAL

June/
Juin
1994
Vol. 60
No. 6

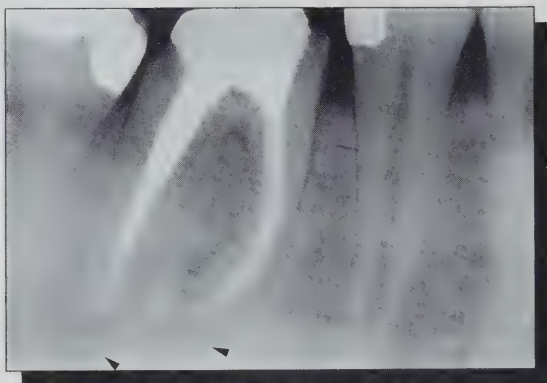


Fig. 2: Pre-operative X-ray. Notice the lesions on each root.

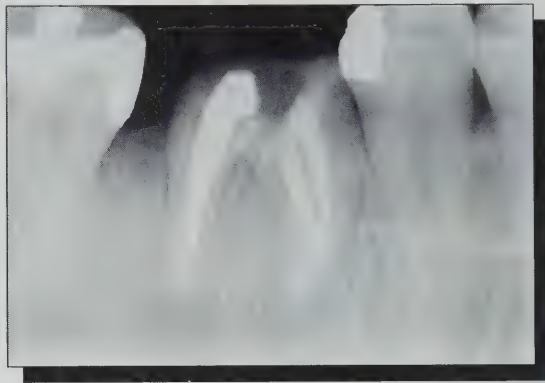


Fig. 3: Reduction of the post to permit the use of trephines.

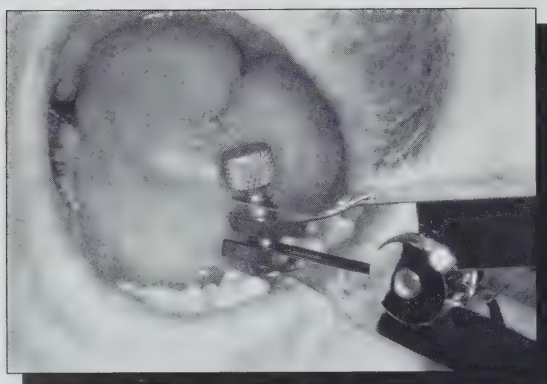


Fig. 4: Extracting clamp in place.

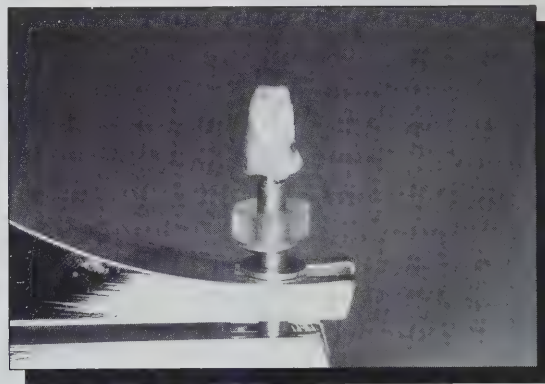


Fig. 5: Post removed. Notice the (buccolingual) width of the post.

surgery a risky and hazardous procedure.

- psychologically, a non-surgical intervention is always less traumatic and better accepted by the patient than a surgical one. This is why periapical surgery for the correction of an endodontic failure should be considered as the procedure of ultimate choice, and should be limited to those cases where its indications are not contended, for example: extremely calcified canals, broken instruments that cannot be removed or by-passed, etc.

The Gonon Post-Pulling System: The Kit and Its Modus Operandi^{4,5}

The mode of action of the Gonon system is quite similar to that of a corkscrew (**Fig. 1**) that has one end resting on the glass walls of the bottle, on which it exerts a pushing force, while a simultaneous and equal traction force is applied in an opposite direction on

the cork itself. The kit includes the following items:

1. A Pointer Drill

This drill, or bur, is specially designed to smooth any irregularities of the tip of the post and to render it more cylindrical in form.

2. Three Trephines

These instruments are used to drill the post material itself to a depth of at least 2.0 mm, thereby decreasing the diameter of the top of the post and producing a concomitant circular shoulder in the post material at its occlusal end. The trephines are supplied in three different sizes:

- No. 1 —
Internal diameter: 1.0 mm;
External diameter: 1.7 mm
- No. 2 —
Internal diameter: 1.2 mm;
External diameter: 1.9 mm
- No. 3 —
Internal diameter: 1.4 mm;
External diameter: 2.1 mm

One of these three sizes should fit most, if not all, of the posts used in clinical dentistry. However, if this is not the case, the coronal end of the metal post should be prepared with conventional carbide or diamond burs, as well as with the pointer-drill (supplied in the kit), until one of the three trephines adequately fits the diameter of the post.

In those cases where the radicular post is broken at the cervical level of the tooth, extra care should be taken in the orientation of the trephine during the drilling of the metal post material.

3. Three Metal Mandrels

The inner diameters of these hollow metal cylindrical tubes correspond to those of the three trephines. They are manufactured from metal that is extremely hard, and their inner surface is fluted in a spiral manner to facilitate the seizure and grasping of the tip of the radicular post. The mandrels are screwed against the post and rotated manually in a clockwise di-

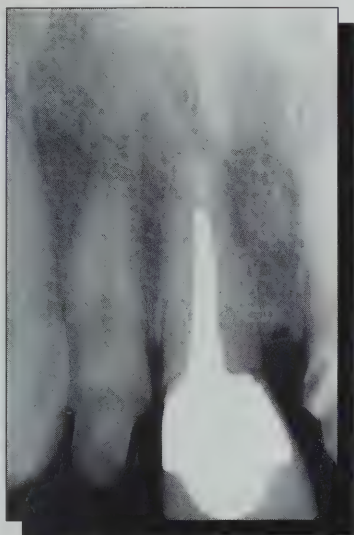


Fig. 6: Pre-operative X-ray.

rection. Before the mandrel is screwed onto the post, three rings (two metal and one rubber) are installed onto its shank, in the order recommended by the manufacturer. This acts as a cushion to prevent root fracture and allows an even distribution of the forces as the post is being extracted.

The Radicular-Post Extractor

This device is basically a lever with two arms. The first arm, which rests against the coronal structure of the tooth, applies an apical force to stabilize the tooth against the pulling or traction force produced by the second arm. This arm is adapted to the metal prehensor, which in turn is firmly secured to the post. The two arms of the extractor are then pulled apart until the radicular post is finally extracted.

The chances of tooth fracture are supposed to be nil if the device is resting properly on strong tooth structure. The tooth is quite stable during the separation of the two lever arms which apply the traction force along the long axis of the post — in other words, in a direction precisely opposite to the path of its insertion.



Fig. 7: After decementation of the crown and post, the clinical state of both crowns on the adjacent teeth is quite satisfactory.



Fig. 8: After removal of the post.



Fig. 9: Fracture of the post at a favorable level.

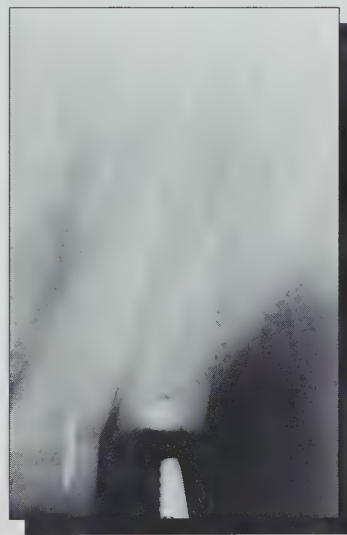


Fig. 10: Post-operative X-ray

Case One

Endodontic Failure Of the Lower Left First Molar Tooth

The root canal treatment was done about 15 years ago. Recently, the patient experienced several episodes of swelling and pain, which was relieved by the administration of antibiotics and analgesics.

A periodontal evaluation of the tooth showed an intact gingival crevice and healthy attached gingiva. On X-ray examination, periapical lesions of endodontic origin were seen on each root (Fig. 2).

Three different treatment options were presented to the patient:

1. Non-surgical re-treatment of the root canal after post removal.
2. Periapical surgery, with retrograde fillings of the root apices.
3. Extraction of the tooth, and its replacement by a fixed bridge or a mono-implant.

The patient preferred the first option. Therefore, the radicular post was removed with the use of the Gonon system, and the root canal re-treated (Figs. 3, 4, 5).

TORADOL®

10 mg tablets & 30 mg/mL IM injections KETOROLAC TROMETHAMINE

Effectively treating acute pain

TORADOL® (ketorolac tromethamine) 10 mg tablets

TORADOL® IM (ketorolac tromethamine injection) 10 mg/mL, 15 mg/mL or 30 mg/mL intramuscular injection

THERAPEUTIC CLASSIFICATION: Analgesic Agent

ACTION:

Toradol (ketorolac tromethamine) is a non-steroidal anti-inflammatory drug (NSAID) that exhibits analgesic activity mediated by peripheral effects. Ketorolac inhibits the synthesis of prostaglandins through inhibition of the cyclo-oxygenase enzyme system. At analgesic doses, it has minimal anti-inflammatory and antipyretic activity. Pain relief is comparable following the administration of ketorolac by intramuscular or oral routes. The peak analgesic effect occurs at 2-3 hours post-dosing with no evidence of a statistically significant difference over the recommended dosage range. The greatest difference between large and small doses of Toradol administered by either route is in the duration of analgesia. Ketorolac tromethamine is rapidly and completely absorbed when administered by either the oral or the intramuscular route. The pharmacokinetics are linear following single and multiple dosing. Steady state plasma levels are attained after one day of Q.I.D. dosing. Following oral administration, peak plasma concentrations of 0.7 to 1.1 µg/mL occurred at an average of 44 minutes after a single 10 mg dose. The terminal plasma elimination half-life ranged between 2.4 and 9.0 hours in healthy adults, while in elderly subjects (mean age = 72 years), it ranged between 4.3 and 7.6 hours. A high fat meal decreased the rate, but not the extent, of absorption of oral ketorolac tromethamine.

The use of an antacid had no effect on the pharmacokinetics of ketorolac. Following intramuscular administration, peak plasma concentrations of 2.2 to 3.0 µg/mL occurred at an average of 50 minutes after a single 30 mg dose. The terminal plasma half-life ranged between 3.5 and 9.2 hours in young adults and between 4.7 and 8.6 hours in elderly subjects (mean age = 72 years). In renally impaired patients there is a reduction in clearance and an increase in the terminal half-life of ketorolac tromethamine (see table below). The primary route of excretion of ketorolac tromethamine and its metabolites (conjugates and the p-hydroxy metabolite) is in the urine (91.4%) with the remainder (6.1%) being excreted in the feces. More than 99% of the ketorolac in plasma is protein bound over a wide concentration range. The hemodynamics of anesthetized patients were not altered by parenteral administration of Toradol.

THE INFLUENCE OF AGE, LIVER AND KIDNEY FUNCTION ON THE CLEARANCE AND TERMINAL HALF-LIFE OF TORADOL IM¹ AND ORAL²

TYPES OF SUBJECTS	TOTAL CLEARANCE (in L/h/kg) ³		TERMINAL HALF-LIFE (in hours)	
	IM MEAN (range)	ORAL MEAN (range)	IM MEAN (range)	ORAL MEAN (range)
Normal Subjects IM (n=54) Oral (n=77)	0.023 (0.010-0.046)	0.025 (0.013-0.050)	5.3 (3.5-9.2)	5.3 (2.4-9.0)
Healthy Elderly Subjects IM (n=13), Oral (n=12) (mean age = 72, range = 65-78)	0.019 (0.013-0.034)	0.024 (0.018-0.034)	7.0 (4.7-8.6)	6.1 (4.3-7.6)
Patients with Hepatic Dysfunction IM and Oral (n=7)	0.029 (0.013-0.066)	0.033 (0.019-0.051)	5.4 (2.2-6.9)	4.5 (1.6-7.6)
Patients with Renal Impairment IM and Oral (n=9)(serum creatinine 1.9-5.0 mg/dL)	0.014 (0.007-0.043)	0.016 (0.007-0.052)	10.3 (8.1-15.7)	10.8 (3.4-18.9)
Renal Dialysis Patients IM (n=9)	0.016 (0.003-0.036)		13.6 (8.0-39.1)	

¹ Estimated from 30 mg single IM doses of ketorolac tromethamine

² Estimated from 10 mg single oral doses of ketorolac tromethamine

³ Litres/hour/kilogram

INDICATIONS:

Oral Route: Orally administered Toradol (ketorolac tromethamine) is indicated for the short-term management of mild to moderately severe pain, including post-surgical pain (such as general, orthopaedic and dental surgery), acute musculoskeletal trauma pain and post-partum uterine cramping pain.

Intramuscular Route: Intramuscular injection of Toradol is indicated for the short-term management of moderate to severe pain, including pain following major abdominal, orthopaedic and gynecological operative procedures.

CONTRAINDICATIONS:

Hypersensitivity: Like other non-steroidal anti-inflammatory drugs, Toradol (ketorolac tromethamine) has been associated with hypersensitivity reactions. Toradol should not be used when there is a known or suspected hypersensitivity to the drug. Because of the possibility of cross-sensitivity, Toradol should not be used in patients with the complete or partial syndrome of nasal polyps, angioedema, bronchospastic reactivity (e.g. asthma) or other allergic manifestations to acetylsalicylic acid (ASA) or other non-steroidal anti-inflammatory drugs. Severe and fatal anaphylactoid reactions have occurred in such individuals.

Gastrointestinal: As with other NSAIDs, Toradol also should not be used in patients with peptic ulcer or active inflammatory disease of the gastrointestinal system. Severe and fatal reactions have occurred in such individuals.

WARNINGS:

The long-term administration of Toradol (ketorolac tromethamine) is not recommended. The most serious risks associated with NSAIDs including Toradol are:

Gastrointestinal Ulcerations, Bleeding and Perforation: Serious gastrointestinal toxicity, such as bleeding, ulceration, and perforation, can occur at any time, with or without warning symptoms, during therapy with non-steroidal anti-inflammatory drugs. To date, studies with NSAIDs have not identified any subset of patients not at risk for developing peptic ulceration and bleeding. Post-marketing experience with Toradol suggests that there may be a greater risk of gastrointestinal ulcerations, bleeding, and perforation in the elderly, and most spontaneous reports of fatal gastrointestinal events are in the aged population.

LONG-TERM USE OF TORADOL: The oral use of Toradol 10 mg QID on a long-term basis is associated with more gastrointestinal tract adverse effects than is ASA 650 mg QID.

In a clinical trial in 823 patients with chronic pain states comparing Toradol tablets 10 mg QID (553 patients) with ASA 650 mg QID (270 patients), during the first week there was 2.4% dropout rate because of upper GI complaints in the Toradol tablets treated patients compared with 0.4% rate in the ASA treated group. After the first 2 weeks, the dropout rate due to GI pain or discomfort were comparable in both treatment groups. The time-adjusted percentages, which are not statistically significantly different, of patients who developed ulcer or upper GI bleeding are as follows:

INTERVAL	CUMULATIVE OCCURRENCE	
	KETOROLAC	ASA
≤ 3 months	0.69*	0*
≤ 6 months	1.59*	0.73*

*There was no statistically significant difference between ketorolac and ASA at either of the intervals tested.

PHYSICIANS SHOULD CAREFULLY WEIGH THE POTENTIAL RISKS AND BENEFITS OF USING TORADOL TABLETS ON A LONG-TERM BASIS. PATIENTS SHOULD BE INSTRUCTED TO WATCH FOR SIGNS OF SERIOUS GI ADVERSE EVENTS AND THEY SHOULD BE MONITORED MORE CLOSELY THAN IF THEY WERE ON ANOTHER NSAID.

Renal Toxicity: The following renal abnormalities have been associated with Toradol and other drugs that inhibit renal prostaglandin biosynthesis: acute renal failure, nephrotic syndrome, interstitial nephritis, renal papillary necrosis.

Haemorrhage: Postoperative haematomas and other symptoms of wound bleeding have been reported in association with the perioperative use of intramuscular Toradol. If Toradol is to be administered to patients who have coagulation disorders or who are receiving drugs that interfere with haemostasis, careful observation is advised.

Hypersensitivity Reactions: The possibility of severe or fatal hypersensitivity reactions should be considered, even for patients with no known history of previous exposure or hypersensitivity to Toradol or other NSAIDs. As with other NSAIDs, patients should be questioned about history of allergy to NSAIDs or ASA or for the syndrome consisting of nasal polyps, ASA allergy and asthma before being prescribed Toradol. Asthmatic patients with triad asthma (the syndrome of nasal polyps, asthma and hypersensitivity to ASA or other NSAIDs) may be at particularly high risk for severe hypersensitivity reactions.

Other NSAIDs: Ketorolac tromethamine is not recommended for concurrent use with other NSAIDs because of the potential for additive side effects.

Use in Pregnancy and Lactation: The administration of ketorolac tromethamine is not recommended during pregnancy or lactation. After 1 day at 10 mg QID, oral dosing, Toradol has been detected in the milk of lactating women at a maximum concentration of 7.9 ng/mL.

Use in Labour: Ketorolac tromethamine is not recommended for use as an obstetric preoperative medication or for obstetrical analgesia because of the known effects of NSAIDs on uterine contraction and fetal circulation.

Use in Children: Safety and efficacy in children have not been established. Therefore, Toradol is not recommended for use in children under age 16.

Use in the Elderly: Because ketorolac is cleared somewhat more slowly by the elderly (See PHARMACOKINETICS) who are also more sensitive to the gastrointestinal and renal effects of NSAIDs (See WARNINGS and PRECAUTIONS), extra caution and the lowest effective dose (See DOSAGE AND ADMINISTRATION) should be used.

PRECAUTIONS:

Physicians should be alert to the pharmacologic similarity of Toradol (ketorolac tromethamine) to other non-steroidal anti-inflammatory drugs that inhibit cyclo-oxygenase. Toradol is not an anesthetic agent and possesses no sedative or anxiolytic properties.

Gastrointestinal Effects: Close medical supervision is recommended in patients prone to gastrointestinal tract irritation, particularly those with a history of peptic ulcer, duodenitis or other inflammatory disease of the gastrointestinal tract. In these cases, the physician must weigh the benefits of treatment against the possible hazards. Patients taking a NSAID including ketorolac tromethamine should be instructed to contact a physician immediately if they experience symptoms or signs suggestive of peptic ulceration or gastrointestinal bleeding. These reactions can occur at any time during the treatment. If peptic ulceration is suspected or confirmed, or if gastrointestinal bleeding occurs, ketorolac tromethamine should be discontinued and appropriate treatment instituted with close patient monitoring.

Renal Effects: As with other drugs that inhibit prostaglandin biosynthesis, elevations of blood urea nitrogen (BUN) and creatinine have been reported in clinical trials with ketorolac tromethamine. Since ketorolac tromethamine and its metabolites are excreted primarily by the kidney, the following precautions are indicated for patients with: **Severely impaired renal function** (serum creatinine values greater than 5 mg/dL, 442 µmol/L); Toradol is not recommended; **Moderately impaired renal function** (serum creatinine values ranging from 1.9 to 5.0 mg/dL, 168 to 442 µmol/L) - The total daily dose of ketorolac tromethamine should be reduced by half. In these patients the rate of ketorolac tromethamine clearance was reduced to approximately half of normal. Patients who are volume depleted may be dependent on renal prostaglandin production to maintain renal perfusion and, therefore, glomerular filtration rate. In such patients, the use of drugs which inhibit prostaglandin synthesis has been associated with further decreases in renal blood flow. Predisposing factors include sepsis, impaired renal function, heart failure, liver dysfunction, diuretic therapy, and advanced age. Caution is advised if ketorolac tromethamine is used in such circumstances. Close monitoring of urine output, serum urea and serum creatinine is recommended until renal function recovers.

Hepatic Effects: Meaningful elevations (greater than 3 times normal) of serum transaminases (glutamate pyruvate (SGPT or ALT) and glutamic oxalacetic (SGOT or AST)), occurred in controlled clinical trials in less than 1% of patients. If clinical signs and symptoms consistent with liver disease develop, or if systemic manifestations occur (e.g., eosinophilia, rash, etc.), ketorolac tromethamine should be discontinued. Patients with impaired hepatic function and clinical signs do not have any clinically important changes in ketorolac tromethamine clearance. Studies in patients with active hepatitis or cholestasis have not been performed.

Fluid and Electrolyte Balance: Fluid retention and edema have been observed in patients treated with Toradol. Therefore, as with many other NSAIDs, the possibility of precipitating a congestive heart failure in elderly patients or those with compromised cardiac function should be considered. Toradol should be used with caution in patients with cardiac decompensation, hypertension or other conditions which cause a predisposition to fluid retention.

Hematologic Effects: Ketorolac tromethamine inhibits platelet function and may prolong bleeding time. It does not affect platelet count, prothrombin time (PT) or partial thromboplastin time (PTT). Unlike the prolonged effects from ASA the inhibition of platelet function by ketorolac tromethamine is normalized within 24 to 48 hours after the drug is discontinued. Patients on full anti-coagulation therapy (e.g. heparin or dicumarol derivatives) may be at increased risk of bleeding if given Toradol concurrently. Thus, the benefit should be weighed against this risk. The concomitant use of Toradol and heparin (5000 U s.c. BID) appears to be associated with less risk (see DRUG INTERACTIONS). In patients receiving anticoagulants, the use of intramuscular haematoma formation from Toradol IM injections may be increased. In post-marketing experience, postoperative wound haemorrhage has been reported with the use of Toradol. Therefore, caution should be exercised when strict haemostasis is critical. Toradol is

recommended as a pre-operative or intra-operative medication because of the risk of passive bleeding. Blood dyscrasias associated with the use of NSAIDs are rare, could occur with severe consequences.

Caution: In common with other non-steroidal anti-inflammatory drugs, ketorolac tromethamine may mask the usual signs of infection.

CONTRAINDICATIONS:

Protein Binding: Toradol (ketorolac tromethamine) is highly bound to human plasma protein (mean 99.2%) and binding is independent of concentration. As ketorolac tromethamine is a highly potent drug and present in low concentrations in plasma, it would not be expected to displace other protein-bound drugs significantly. Therapeutic concentrations of digoxin, warfarin, acetaminophen, phenytoin, and tolbutamide did not alter ketorolac tromethamine protein binding.

Coagulant Therapy: Prothrombin time should be carefully monitored in all patients receiving oral anticoagulant therapy concomitantly with ketorolac tromethamine. Toradol IM with two doses of 5000 U of heparin to 11 healthy volunteers resulted in a mean time to bleeding time of 6.4 min (3.2-11.4 min) compared to a mean of 6.0 min (3.4-7.5 min) for aspirin alone and 5.1 min (3.5-8.5 min) for placebo. The *in vitro* binding of warfarin to plasma proteins is only slightly reduced by ketorolac tromethamine (99.5% control vs. 99.3%) at plasma concentrations of 5 to 10 µg/mL.

Digoxin: Ketorolac tromethamine does not alter digoxin protein binding.

Salicylates: *In vitro* studies indicated that, at therapeutic concentrations of salicylates (10 µg/mL), the binding of ketorolac tromethamine was reduced from approximately 99.2% to 98.7% representing a potential two-fold increase in unbound Toradol plasma levels.

Enzyme Induction: There is no evidence, in animal or human studies, that ketorolac tromethamine induces or inhibits the hepatic enzymes capable of metabolizing itself or other drugs. Hence, it would not be expected to alter the pharmacokinetics of other drugs due to enzyme induction or inhibition mechanisms.

Probenecid: Concomitant administration of ketorolac tromethamine and probenecid results in the decreased clearance of ketorolac and a significant increase in ketorolac plasma levels (approximately three-fold increase) and terminal half-life (approximately two-fold increase).

Furosemide: Ketorolac tromethamine reduces the diuretic response to furosemide by approximately 20% in normovolemic subjects.

Lithium: Some NSAIDs have been reported to inhibit renal lithium clearance, leading to an increase in plasma lithium concentrations and potential lithium toxicity. The effect of ketorolac tromethamine on lithium plasma levels has not been studied.

Methotrexate: The concomitant administration of methotrexate and some NSAIDs has been reported to reduce the clearance of methotrexate, thus enhancing its toxicity. The effect of ketorolac tromethamine on methotrexate clearance has not been studied.

Morphine: Intramuscular Toradol has been administered concurrently with morphine over several clinical trials of postoperative pain without evidence of adverse interactions.

ADVERSE EVENTS:

ADOL TABLETS: Short-Term Patient Studies - The incidence of adverse reactions in 371 patients receiving multiple 10 mg doses of Toradol (ketorolac tromethamine) for pain resulting from surgery or dental extraction during the post-operative period (less than 2 weeks) is listed below. These reactions may or may not be drug related. **Incidence between 4 and 9%:** **Nervous system** - somnolence, insomnia; **Digestive system** - nausea. **Incidence between 2 and 4%:** **Nervous system** - nervousness, headache, dizziness; **Digestive system** - diarrhea, dyspepsia, gastrointestinal pain, constipation. **Body as a whole** - fever. **Incidence 1% or less:** **Nervous system** - abnormal dreams, anxiety, dry mouth, hyperkinesia, paresthesia, increased sweating, hiccups, hallucinations; **Digestive system** - anorexia, flatulence, vomiting, stomatitis, gastritis, gastrointestinal disorder, sore throat; **Body as a whole** - asthenia, pain, back pain; **Cardiovascular system** - vasodilatation, palpitation, migraine, hypertension; **Respiratory system** - rhinitis, increased, dry nose; **Musculo-skeletal system** - myalgia, arthralgia; **Skin and appendages** - rash, urticaria; **Special senses** - blurred vision, ear pain; **Urogenital system:** dysuria.

Long-Term Patient Study - The adverse reactions listed below were reported to be probably drug related in 553 patients receiving long-term oral therapy (approximately 1 year) with Toradol. **Incidence between 10 and 12%:** **Digestive system** - dyspepsia, gastrointestinal pain.

Incidence between 4 and 9%: **Digestive system** - nausea, constipation; **Nervous system** - headache. **Incidence between 2 and 3%:** **Digestive system** - diarrhea, flatulence, gastrointestinal fullness, peptic ulcers; **Nervous system** - Dizziness, somnolence; **Metabolic/Nutritional disorders** - edema. **Incidence 1% or less:** **Digestive system** - eructation, stomatitis, vomiting, anorexia, duodenal ulcer, gastritis, gastrointestinal haemorrhage, increased appetite, melena, mouth irritation, rectal bleeding, sore mouth; **Nervous system** - abnormal dreams, anxiety, depression, dry mouth, insomnia, nervousness, paresthesia; **Special senses** - tinnitus, taste perversion, normal vision, blurred vision, deafness, lacrimation disorder; **Metabolic/Nutritional disorders** - high increased, alkaline phosphatase increase, BUN increased, excessive thirst, generalized edema, hyperuricemia; **Skin and appendages** - pruritus, rash, burning sensation skin; **Body as a whole** - asthenia, pain, back pain, face edema, hernia; **Musculo-skeletal system** - arthralgia, myalgia, joint disorder; **Cardiovascular system** - chest pain, chest pain substernal, raised; **Respiratory system** - dyspnea, asthma, epistaxis; **Urogenital system** - hematuria, increased urinary frequency, oliguria, polyuria; **Hemic and lymphatic** - Anemia, purpura.

ADOL IM: The adverse reactions listed below were reported in Toradol IM clinical efficacy trials. In these trials patients (n=660) received either single 30 mg doses (n=151) or multiple dosing (n=509) over a time period of 5 days or less for pain resulting from surgery.

Adverse reactions may or may not be drug related. **Incidence between 10 and 13%:** **Nervous system** - somnolence; **Digestive system** - Nausea. **Incidence between 4 and 9%:** **Nervous system** - headache; **Digestive system** - vomiting; **Injection site** - injection site pain. **Incidence between 2 and 3%:** **Nervous system** - sweating, dizziness; **Cardiovascular system** - vasodilatation. **Incidence 1% or less:** **Nervous system** - insomnia, increased dry mouth, abnormal dreams, anxiety, depression, paresthesia, nervousness, paranoid reaction, speech disorder, hiccups, libido increased, excessive thirst, inability to concentrate, stimulation; **Digestive system** - flatulence, anorexia, constipation, diarrhea, dyspepsia, gastrointestinal fullness, gastrointestinal haemorrhage, gastrointestinal pain, melena, sore throat, liver function abnormalities, rectal bleeding, stomatitis; **Cardiovascular system** - hypertension, chest pain, tachycardia, haemorrhage, palpitation, pulmonary embolism, syncope, ventricular tachycardia, pallor, flushing; **Injection site** - injection site reaction; **Body as a whole** - asthenia, fever, back pain, chills, neck pain; **Special senses** - taste perversion, tinnitus, blurred vision, diplopia, retinal haemorrhage; **Musculo-skeletal system** - myalgia, twitching; **Respiratory system** - asthma, high increased, dyspnea, epistaxis, hiccup, rhinitis; **Skin and appendages** - pruritus, rash, subcutaneous hematoma, skin disorder; **Urogenital system** - dysuria, urinary retention, oliguria, increased urinary frequency, vaginitis; **Metabolic/nutritional disorders** - edema, hypokalemia, hypovolemia. **Hemic and lymphatic system** - anemia, coagulation disorder, purpura.

Post-Marketing Experience: The following post-marketing adverse experiences, although rare (1% or less), have been reported for patients who have received either formulation of Toradol.

Renal events - acute renal failure, flank pain with or without haematuria and/or azotemia; **Hypersensitivity reactions:** bronchospasm, laryngeal edema, hypotension, flushing, rash, and anaphylactoid reactions, such reactions have occurred in patients with no prior history of hypersensitivity. **Gastrointestinal events** - gastrointestinal hemorrhage, peptic ulceration, gastrointestinal perforation; **Hematologic events** - postoperative wound haemorrhage, rarely requiring blood transfusion (see PRECAUTIONS), thrombocytopenia; **Central nervous system** - convulsions, abnormal dreams, hallucinations, hyperkinesia, hearing loss; **Cardiovascular** - pulmonary edema; **Dermatology** - Lyell's syndrome, Stevens - Johnson syndrome, exfoliative dermatitis, maculopapular rash.

OVERDOSAGE: The absence of experience with acute overdosage precludes characterization of sequelae and assessment of antidotal efficacy at this time. In a gastroscopic study of healthy subjects, daily doses of 360 mg given over an 8-hour interval for each of five consecutive days (3 times the highest recommended dose) caused pain and peptic ulcers which resolved after discontinuation of dosing.

DOSAGE AND ADMINISTRATION:

Adults: Dosage should be adjusted according to the severity of the pain and the response of the patient. **Oral:** The usual oral dose of Toradol (ketorolac tromethamine) is 10 mg every 4 to 6 hours for pain as required. Doses exceeding 40 mg per day are not recommended. Toradol is recommended for short-term use only, i.e., for a maximum of a few weeks.

Parenteral: The recommended usual initial dose is 30 mg. Subsequent dosing may be 10 mg to 30 mg every 4-6 hours as needed to control pain. It is recommended that the administration of Toradol IM be limited to short-term therapy (not over 5 days) and the total daily dose should not exceed 120 mg.

This is because the risk of toxicity appears to increase with longer use at recommended doses (see WARNINGS and PRECAUTIONS). The administration of continuous multiple daily doses of Toradol IM has not been extensively studied. There has been limited experience with intramuscular dosing for more than 3 days since the vast majority of patients have transferred to oral medication or no longer required analgesic therapy after this time. In the initial post-operative period, more frequent dosing (e.g. every 2 hours) may be employed but the total daily dosing should not exceed 120 mg/day. If supplementary analgesia is required, a concomitant low dose of opiate can be used.

Patients under 50 kg, over age 65 years, or with less severe pain at baseline: the lower end of the dosage range (10-15 mg 4 times a day) is recommended.

Impaired Renal Function - Moderate - In patients with impaired renal function (serum creatinine values ranging from 1.9 to 5.0 mg/dL or 168 to 442 µmol/L), the total daily dose of Toradol should be reduced by half;

Severe - In patients with severely impaired renal function (serum creatinine values greater than 5 mg/dL, or 442 µmol/L) Toradol is not recommended.

Conversion from Parenteral to Oral Therapy: Toradol tablets may be used either as monotherapy or as follow-on therapy to parenteral ketorolac. Toradol IM should be replaced by an oral analgesic as soon as feasible. When Toradol tablets are used as a follow-on therapy to parenteral ketorolac, the total combined daily dose of ketorolac (oral + parenteral) should not exceed 120 mg on the day the change of formulation is made. Subsequent oral dosing should not exceed the recommended daily maximum of 40 mg.

Directions for Use of the Prefilled Syringes: Insert the plunger into the syringe barrel and thread it onto the screw. WITHOUT REMOVING THE NEEDLE GUARD, apply quick, firm pressure to the plunger to break the inner seal. (You will feel it let go). Pull back on the plunger slightly to relieve pressure. Remove the needle guard by twisting as you pull. Use the unit as you would a normal syringe. Dispose of properly. Single use only. Discard Unused Portions. Parenteral drug products should be inspected visually for particulate material and discoloration prior to use. Toradol (ketorolac tromethamine) is a Schedule F drug.

Stability and Storage Recommendations:

Toradol Tablets: Store at room temperature with protection from light.

Toradol IM: Store at room temperature with protection from light.

Availability of Dosage Forms: Toradol (ketorolac tromethamine) is available as 10 mg white round film coated tablets containing ketorolac tromethamine, microcrystalline cellulose, lactose and magnesium stearate with one side printed in red with TORADOL inside bold T and other side with Syntex. Toradol (ketorolac tromethamine) 10 mg tablets are available in bottles of 100 and 500 tablets.

Toradol IM is available in 1 mL ampoules (trays of 10) containing 10 or 30 mg/mL.

Toradol IM is also available in 1 mL syringes (1/box) containing 15 or 30 mg/mL.

Product Monograph available on request.

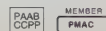
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Case Two

The patient's history revealed frequent loosening and decementation of the crown and post of tooth # 11 (Fig. 6). On X-ray examination, a fracture of the post is seen about 6.0 mm below the gingival line (Fig. 7).

Clinically, teeth # 11 and # 21 have porcelain crowns of acceptable quality, with adequate marginal adaptation. It was therefore decided to attempt removal of the broken intra-radicular post with the Gonon system.

The procedure was successful, despite the gouging of sound tooth structure in order to reach the broken post. In this case, there was still enough remaining tooth substance to remake a new post (Fig. 8).

Case Three

This case is quite similar to Case Two, but the fracture of the post occurred at a more coronal level. Hence, less tooth structure is lost during post removal (Figs. 9 & 10).

Conclusion

Endodontic failures associated with the presence of intra-radicular posts do exist and usually cause a dilemma to the dental practitioner. Non-surgical re-treatment remains the treatment of choice.¹

Compared to other post-pulling systems and devices, the Gonon seems to be well-suited, especially for those cases where there is a fracture of the post substance at the gingival level or slightly below. ■

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PHARMACOLOGY: It is active against the following gram-positive organisms: *S. aureus* (including penicillin resistant strains), beta-hemolytic streptococci, *S. viridans*, *S. faecalis* and *S. pneumoniae*, *C. diphtheriae*, clostridia. Except for *B. pertussis*, *H. influenzae* (approximately 50% of strains) and *neisseria*, gram-negative organisms are generally considered as resistant to spiramycin. Bacterial resistance to spiramycin has been reported to develop, including cross resistance between spiramycin and erythromycin. However, most of the erythromycin resistant strains of *S. aureus* are still sensitive to spiramycin. **INDICATIONS:** For the treatment of infections of the respiratory tract, buccal cavity, skin and soft tissues due to susceptible organisms. *N. gonorrhoeae*: as an alternate choice of treatment for gonorrhea in patients allergic to the penicillins. Before treatment of gonorrhea, the possibility of concomitant infection due to *T. pallidum* should be excluded. **CONTRAINDICATIONS:** Hypersensitivity to the drug. The levels of spiramycin attained in the CSF are much lower than those in the blood and are too low to be clinically useful. Therefore, spiramycin must not be used in patients with meningitis. **PRECAUTIONS:** Administer antibiotics, including spiramycin cautiously to any patient who has demonstrated some form of allergy, particularly to drugs. The possibility of superinfection caused by overgrowth of nonsusceptible organisms should be kept in mind during prolonged or repeated therapy. If superinfection occurs, discontinue the drug and take appropriate measures. **Pregnancy:** Safety of this product for use during pregnancy has not been established. **ADVERSE EFFECTS:** Spiramycin has a low toxicity and rarely produces serious adverse effects; these include epigastric pain and abdominal discomfort, nausea, vomiting, diarrhea and skin sensitization. **OVERDOSE: Symptoms:** No case of accidental overdosage has been reported. In oral doses over 4 g/day, abdominal discomfort, nausea or diarrhea may occur. **TREATMENT:** No specific treatment has been proposed. Management should be symptomatic. **DOSAGE: Adults:** 6,000,000 to 9,000,000 I.U. (4 to 6 capsules of Rovamycine '500') per 24 hours, in 2 divided doses. In severe infections, the daily dosage may be increased to 12,000,000 to 15,000,000 I.U. (8 to 10 capsules of Rovamycine '500' per day). *Gonorrhea:* 12,000,000 to 13,500,000 I.U. (8 or 9 capsules) in a single dose. *Children:* The usual daily dosage is based on 150,000 I.U./kg body weight in 2 or 3 divided doses; the following calculated dosages are given as a guide (see Table 1). Spiramycin is stable in gastric juices and

TABLE 1

Body weight	Dosage in capsules of Rovamycine '250' (750,000 I.U. Spiramycin/capsule)
15 kg	3 capsules/day
20 kg	4 capsules/day
30 kg	6 capsules/day

absorption is not affected by food. In severe infections, the daily dosage may be increased by one half. In the treatment of beta-hemolytic streptococcal infections, adequate spiramycin dosage should be administered for 10 days. **SUPPLIED: Rovamycine '250':** Each orange and red capsule contains: 750,000 I.U. of spiramycin. Tartrazine-free. Bottles of 50. **Rovamycine '500':** Each grey and red capsule contains: 1,500,000 I.U. of spiramycin. Tartrazine-free. Bottles of 50.

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FEATURE

1944



Canadian Dentists At War — 1944

P. Ralph Crawford, BA, DMD

When Canadian dentists landed on the beaches of Normandy in 1944, shortly after D-Day, they carried with them a tradition of excellence and dedication that was the envy of the world.

It was a tradition that began in 1915, with the formation of the Canadian Army Dental Corps, and had grown both in stature and manpower ever since. By 1944, the renamed Canadian Dental Corps numbered 1,562 dental officers and 3,725 other ranks. Before the war ended in 1945, more than 2,500 of the corps' officers and other ranks would serve overseas, and 43 would be killed or die in active service.

And it was this tradition that would, in the 1940s, move the then president of the British Dental Association to say: "The Canadian Army is the only army in the world that attempts to send its soldiers to the front dentally fit and keep them fit."

Today, some 50 years after the Allies landed in Normandy, the tradition of excellence and dedication is being continued by the officers and other ranks of the Canadian Forces Dental Services, both at home and abroad. In addition to providing oral health care to military personnel stationed in Canada, officers and other ranks of Canadian Forces Dental Services are administering to the dental needs



Canadian dental officers in Normandy, 1944. Left to right, front row: Drs. G. Merkley, F. Herbert, J. Neilson. Back row: G. Waldon, I Hamilton, J. Willard.

of Canadian peacekeepers throughout the world.

This month — the 50th anniversary of the allied invasion of Europe — many Canadian dentists and allied dental personnel will be among those recalling the Normandy landings and the events that ultimately led to the end of the conflict on V/E Day, May 8, 1945.

One of them will be Dr. Jack Willard. Now 80 and living in Chatham, Ontario, in 1944 Captain Willard was a young dental officer with No. 5 Dental Company, Canadian Third Division.

Back then, he recalls, each dental officer was provided with a dental team and a mobile dental clinic

that invariably had a huge red cross painted on the sides and back. The team consisted of the officer/dentist, a sergeant/dental assistant, and a driver/orderly. Usually the driver/orderly, by necessity, was also a good mechanic. Clinics were furnished with portable dental equipment, including a good old foot engine and a noisy generator.

Although the Third Division hit the Normandy beaches on June 6, 1944, No. 5 Dental Company, which included 30 vehicles and was under the command of Lt. Col. Roy Denholm, did not land until July 11. Even at that, the beachhead wasn't completely safe, and

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the dental unit had a few near misses.

"It was about two in the morning when our unit stopped for a little break," recalled Dr. Willard. "The driver of our last vehicle left his parking lights on, and within a few minutes a Jerry plane dropped a string of bombs on us. I managed to jump in a ditch with about six inches of dust and dirt when I heard his bombs whistling down. The only thing that saved No. 5 Company was the fact the German pilot thought the clinic with the lights on was the first vehicle — so his bombs missed us by only a narrow margin."

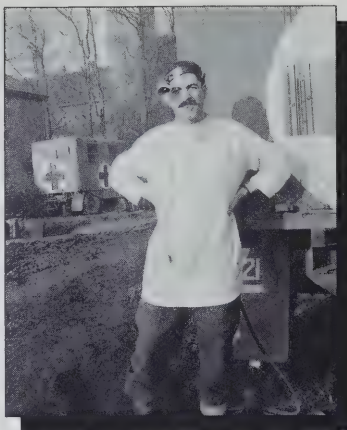
No. 5 Dental Company finally moved up to a position about two miles north of Caen and began an endless round of work. "We kept busy all the time," said Dr. Willard. "At night our quarters were often just a slit trench. Sometimes we managed to get a tent over us, but not always."

The credo that brought Canadian dentists to the front lines during the war was probably best expressed by Major Paul Manseau, writing in the December 1944 issue of the *Journal*, when he said: "The fury of battle doesn't prevent aching teeth from making their victims suffer."

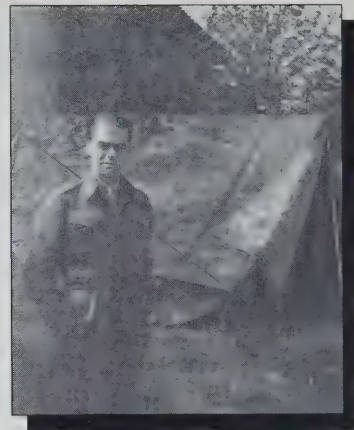
Dr. Manseau, who left his Drummondville, Quebec, practice behind to serve overseas, was attached to the Royal 22nd Regiment throughout the Sicilian and Italian campaigns.

Perhaps the members of Canada's dental corps also felt a sense of pride at been the best in the world. A faded clipping from Canada's armed forces newspaper, the *Maple Leaf*, dated Friday, December 1, 1944, displays the headline: "Dental Corps Works Under Fire and Services Troops Of All Nationalities." The accompanying story provides an excellent account of the services provided by the No. 9 Canadian Dental Company in particular, and the entire dental contingent in general.

"Canada's dental corps is second to none in any army in the world in personnel, equipment and operation. These professional men and their assistants have been



Captain Jack Willard with his dental unit in Normandy, 1944.



Lt.-Col. Kenneth Baird, Commanding Officer, No. 9 Dental Company, 1944. Dr. Baird later served as director general/dental services from 1958 until his retirement in 1966.

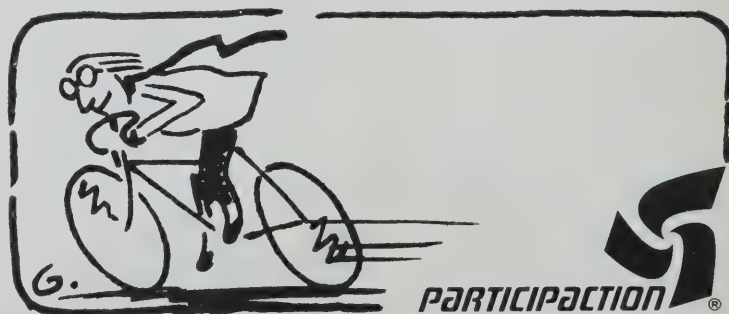
through the mill from Caen, Vaucelles, Falaise and the long run across France, Belgium into Holland and finally the Nijmegen salient. They take the latest in dental attention to the fighting men and know what it's like to work under shell and mortar fire...Throughout the Canadian push in Europe, they've handled the Canucks, English, Yanks, Czechs, Dutch, Belgians, Poles, civilians and many others. They've made and repaired enough false teeth to keep a nation chewing and kept many a good set fit for hardtack. They handle battle casualties of a dental nature either on the spot or through medical channels, for every operator is familiar with the surgical method of dealing with facial injuries."

The faded clipping from the *Maple Leaf* belongs to Dr. Kenneth Baird of London, Ontario. In 1944, he was a Lieutenant Colonel, and the No. 9 Dental Company was under his command. But the Baird

family's tradition of serving as military dentists actually preceded the Second World War by almost half a century. Dr. Kenneth Baird's father, Dr. D. Baird, of Ottawa, was one of two dentists who served as part of the Canadian contingent that fought with the British forces during the Boer War (1899-1902).

As for Dr. Kenneth Baird, he was promoted to brigadier general in 1958 when he was appointed director general/dental services, a post he held until his retirement in 1966. ■

Editor's note: Dr. Willard has informed us that four Canadian dentists landed on the beaches of Normandy within days of the main invasion. These four — Drs. R.D. Reid, 22nd Field Ambulance (Maj.); J.J. Scachter, 23rd Field Ambulance (Maj.); K. Levinson, 17th Field Ambulance (Maj.); and L. Millar, Light Field Ambulance (Maj.) — deserve special recognition.



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SCIENTIFIC



The Oral Health Of Toronto's Street Youth

Jack Lee, DDS, MPH, Dip.Grt.

Steve Gaetz, MA, PhD

Fred Goettler, M.A.Sc., M.Sc.

The recession that began in 1990 hit Metropolitan Toronto particularly hard, with job losses in the city accounting for nearly one-half of all jobs lost in Canada. Although most economists now believe that the recession is over, it has been slow to release its hold on Toronto—the city's population of homeless and under-housed people has increased, and is now estimated to number more than 25,000.¹

Toronto's youth have felt the effects of the recession more than other population groups. The unemployment rate for young men under 24 years of age is just under 20 per cent. Women in the same age group fare slightly better, with an unemployment rate of just under 15 per cent.²

With the increase in the numbers of homeless in Toronto, there has also been an increase in awareness of the health and dental needs of this population. The *Street Health Report* looked at the health status and barriers to health care of 458 homeless men and women in Toronto, ranging in age from 16 to 83. It found that the homeless were almost twice as likely not to have received dental care in the past year compared to the general Toronto population. Furthermore, the homeless were three times more likely than the general population to not have been examined by a dentist within the past five years.³

To date, while no clinical survey has been done to determine the dental needs of Canada's homeless population, data are available from the United States, Australia and England. A survey of 84 sheltered homeless children over the age of five, conducted in Seattle, Washington, reported that 36 per cent had some dental problems such as cavities.⁴ A study of 529 homeless adults in Los Angeles found that 27 per cent reported having had a toothache in the last month.⁵ Similarly, a survey of 68 adults present in emergency shelters in Hennepin County, Minnesota, found that 63 per cent reported needing dental treatment.⁶

An Australian study of 162 homeless men found that nine per cent needed immediate treatment for urgent problems, 17 per cent had large carious lesions, and 69 per cent had periodontal disease.⁷ An English study of 28 men found that 42 per cent required partial or full dentures, and 54 per cent had other conditions, such as advanced periodontal disease.⁸

Because of the increasing numbers of street youth in downtown Toronto, and the lack of data on the dental health status of this specific population, the Department of Public Health was approached by staff from the Shout Clinic to conduct a dental survey.

Shout Clinic is a health service for street-involved youths under 25. The clinic's main purpose is to

increase the accessibility of health care to an under-served and marginalized youth population. While the clinic's staff includes three nurses, a physician, a mental health counsellor and a health promoter, it does not include any dental staff.

Methods

Drawing on the network established among the downtown agencies serving Toronto's street youth, six agencies were selected as sites for conducting the dental survey. For the purposes of the survey, the definition of a homeless individual included anyone with no safe place of their own who had spent the previous night in an indoor or outdoor public space, in a shelter, in a hotel/motel, or at a friend's place, and were uncertain if they could live there for the next 30 days.

Once informed consent was received, each participant was asked a series of 26 questions to determine his or her dental behavior and perceptions of dental need, as well as to obtain demographic data such as length of time on the street. After the questionnaire was administered, a dental screening team from the Department of Public Health, consisting of a dental hygienist and dental assistant, examined each participant using portable equipment, including a chair and a fibre optic light. The screening exam was mainly visual—tac-

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tile exploration was minimal and used to verify a visual concern or at the request of individual participants. Screening took less than 10 minutes per participant, after which each was given \$5, a toothbrush, and a food coupon. The Ontario Ministry of Health Dental Health Survey, a survey tool administered each year by the Department of Public Health and one with which the screening team was very familiar, was used as the screening format. The use of this format allows for a comparison of the results of this study versus the dental health data for teenagers in the general population of Toronto. This would determine if any inequalities in dental health status exist, and thus support any necessary advocacy on behalf of street youth.

Results

The survey included 174 homeless youths, ranging in age from 14 to 25 years, with a mean age of 20.3 years. Most were male (73.6 per cent). The mean number of years on the street was 3.8 years, with a range from less than one year (23.6 per cent) to over 13 years. The average age at leaving home was 17.5 years, with a range from 10 to 24 years. Only 32.2 per cent of participants were born in Metropolitan Toronto. Of the others, 14.8 per cent were born in small-town Ontario, 11.5 per cent in the Maritimes, and 17.8 per cent outside of Canada. This latter figure is about half the comparable figure for the general population of Toronto.

When asked the date of their last dental visit (**Table I**), only 22.4 per cent of participants reported seeing a dentist in the last year, while 40.8 per cent had not been to the dentist in the past two years. The mean time of last visit was 2.8 years ago. When asked what was the biggest factor preventing them from seeing a dentist, the majority (54 per cent) responded money. Another 17.8 per cent stated they were scared.

When asked about dental problems within the past four weeks, 40.2 per cent indicated that they had pain when chewing and 12.6 per cent reported pain that had

Table I

Time Of Last Dental Visit

< 1 Year	22.4%
1 - < 3 Years	36.8%
3 - < 5 Years	28.7%
5 + Years	12.1%

Table II

Mean DMFT, Decayed Teeth and Gingival Health Score By Four Categories Of Number Of Years On the Street

	Years On the Street				
	0 - < 1	1 - < 3	3 - < 5	5 +	
Mean of DMFT	4.5	4.4	5.2	7.2	**
n	41	39	23	70	
Mean of Decayed Teeth	0.9	1.1	1.3	1.1	n.s.
n	41	39	23	70	
Mean of Gingival Health Score	1.1	1.1	1.5	1.6	*
n	41	39	23	70	

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$ (for comparison of variable of interest between categories of years on the street)

Table III

Mean DMFT By Three Categories Of Age

	Age Groups			
	14 - 18	19 - 22	23 - 25	
Mean of DMFT	3.7	5.6	8.3	***
n	58	69	47	

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$ (for comparison of mean DMF between categories of age)

kept them awake. Additionally, 44.8 per cent reported that they had suffered from bleeding gums. Not surprisingly, when asked if they thought they needed dental treatment or advice now, 74.1 per cent responded affirmatively. Unfortunately, when asked where they would go for help regarding a toothache or bleeding gums, fully one-third responded that they did not know.

Of the 50.6 per cent who reported that they had suffered no pain, 37.5 per cent were found to have tooth decay, and 39.8 per cent had calculus and/or were in urgent need of periodontal treatment.

In terms of oral hygiene behavior, 71.8 per cent reported brushing their teeth at least once a day,

yet only 5.7 per cent reported using dental floss once a day.

Dental screening indicated a mean DMFT of 5.7 in the homeless youths participating in the survey, which is in marked contrast to a DMFT of 1.7 in 15 year olds in the general Toronto population. The "F" or filled component was 4.2, which represents a fairly high level of treatment. The "M" or missing was only 0.3, with 85.1 per cent of the youths having lost no teeth. The "D" was 1.2, which compares to a "D" of only 0.2 for a 15 year old in the general Toronto population. However, 58.7 per cent of the homeless youths had no visible decay, and of those with decay, over half had it in only one or two teeth. An interesting side note, given the level of past treatment for this group, was that only 3.4 per cent

**Table IV****Number Of Respondents By Categories Of Gingival Health Score**

	Years On The Street			
	0 - < 1	1 - < 3	3 - < 5	5 +
Gingival score 0 or 1	27 (66%)	28 (72%)	9 (39%)	30 (43%)
Gingival score 2 or 3	14 (34%)	11 (28%)	14 (61%)	40 (57%)

Chi squared test of independence = 12.84, $p < 0.01$

Table V**Mean DMFT and Decayed Teeth By Four Categories Of Gingival Health Score**

	Categories Of Gingival Health Score			
	0	1	2	3
Mean of DMFT	4.5	4.4	6.6	8.8
n	39	55	60	20
Mean of Decayed Teeth	0.3	0.7	1.4	2.9
n	41	55	60	20

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$ (for comparison of variable of interest between categories of gingival health score)

had evidence of sealant placement.

The gingival tissues of the study participants, on the other hand, were considerably less healthy. Only 22.4 per cent had normal gingiva, defined as healthy in appearance (gingival health score of 0), while 31.6 per cent had some bleeding (gingival health score of 1). An additional 34.5 per cent had calculus (gingival health score of 2), and another 11.5 per cent were deemed to have an urgent situation, defined as apparent periodontal involvement or excessive inflammation (gingival health score of 3).

Discussion

In general, street youth, whether "living rough," in hostels or staying with friends, are exposed to a wide range of short-term and long-term health risks. Considerable research over the last several years has demonstrated that "poor hygiene, inadequate diets, constant exposure to the elements, lack of sleep and physical injuries make them especially susceptible to disease."⁹ Health maintenance is difficult for

those living on the street. The inherent instability of the street youth lifestyle encourages young people to focus on their immediate needs — securing food and shelter — and to give lower priority to the long-term consequences of behaviors. Given the instability of the lives of these youths, and the difficulty they have in following a routine preventive regimen, we first were interested in analyzing how their dental health varied with the number of years they had been on the street. As can be seen in **Table II**, mean DMFT was significantly different between categories. The greatest mean DMFT was for those who had been on the street for five years or more — these youths had a mean DMFT of 7.2.

When the decay portion (D) was compared, there was no statistical significance in untreated decay levels between street youths and 15 year olds in the general Toronto population. While the untreated decay levels in street youths were higher, it would appear, based on the constancy of these levels over the years, that this group has access to some limited treatment.

There was a statistical significance between categories when the average gingival health scores of study participants were compared. Gingival health scores appear to increase as years on the street increase, with a higher score indicating a more severe problem.

Both the DMFT scores and the gingival health scores indicate that the preventive behaviors practised by the general Toronto population are not routinely practised by street youth. Given the instability of their situation, this is not unexpected. Yet, it does present unique challenges to dental professionals who may be working with these youth.

Next, we looked at how DMFT related to age. As can be seen in **Table III**, there were statistically significant differences between the age categories. The mean DMFT increases from 3.7 for the youngest age group to 8.3 for the oldest. This corresponds to the fact that the oldest youths have been on the street the longest. Similarly, when we examined the various categories of gingival health scores versus the number of years on the street, we found a statistically-significant association (**Table IV**). The percentage of those with high (poorer) gingival health scores of 2 or 3 rose from 34 per cent for those "less than one year" on the street, to 57 per cent for those who had been on the street for "more than five years."

Lastly, we looked at the DMFT and D scores in relation to the gingival health scores. Both the DMFT and the D scores are statistically significant between the different categories of gingival health scores. Both increase as the gingival health scores increase, as seen in **Table V**. What is apparent, despite different disease processes, is that in this population, youths with higher levels of dental decay, past and present, are also at greater risk for more severe gingival disease. It would appear that a higher gingival health score in an individual would predict a higher level of untreated dental decay.

Conclusion

Street youths are placed in a situation where they face a high risk of

illness. In spite of this, they are often reluctant to access health care services. The survey of 174 street youths in Toronto shows that there is clearly a need for preventive and restorative dental treatment, a need that is considerably greater than exists among the general youth population of Toronto. For street youths, the ideal service would be comprehensive and supportive, based on the principles of affordability and accessibility. Unfortunately, the present organization of dental services in Ontario does not allow for full affordability and accessibility for these youths. As discussed earlier, a lack of money is the primary barrier for the majority of street youths wishing to seek dental treatment. In Ontario, the Children In Need Of Treatment Program (CINOT), which covers treatment costs for urgent cases, does not extend beyond the age of 15. Metropolitan Toronto offers emergency services only to its Department of Community and Social Services' welfare recipients. However, only a small minority of street youths are on welfare, due to their highly transient lifestyle. Toronto's Department of Public Health has several clinics offering free comprehensive treatment to targeted populations, including high school students. Unfortunately, these clinics are operating at maximum capacity and are only able to offer services to a very small number of street youths on an emergency basis. Furthermore, due to their client population, which is generally the very young or very old, street youths do not feel comfortable receiving services in the clinics.

There are several other barriers to access of dental services in addition to the lack of money. As mentioned, many street youths are not on welfare and feel that the service will be denied to them. Second, the instability of their lifestyle makes it extremely difficult for street youths to book and keep regular appointments. Third, and importantly, there is a lack of trust. Given the prior experience of street youths at home and in institutional contexts (school, detention centres, group homes, etc.), many have developed a lack of trust of people in positions of authority

who "claim" a desire to help them. Fourth, it is also true that some health care providers are uncomfortable serving street youths because of their appearance, smell and behavior, which could be disturbing to other patients. Finally, there is a perception among street youths that they will not get the same level of service as other clients. This perception of discrimination, real or imagined, is significant because it influences behavior.

Various options are being explored to address the accessibility and affordability problems. For example, Evergreen, an agency serving a very specific subgroup of street youths, will be opening a one-chair clinic, staffed by volunteer dentists practising in the city. West Central Community Health Centre, through its dental staff, has been working with a number of agencies in order to improve services to this population. And Toronto's Department of Public Health will be using information from the survey to develop more appropriate venues for dental health promotion. However, these measures represent only the beginning of the dental professions' efforts to meet the challenge of improving the dental health status of Canada's street youth.

To summarize, this survey has been important in two ways. First, it has shown that the dental needs of street youth are far greater than those of the general youth population of Toronto, and, secondly, that the delivery of dental services to this population must be tailored to the unique environment in which they live. ■

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Correlates Of Tooth Loss In A Canadian Adult Population

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ABSTRACT

Oral health data collected from a mail survey of an Ontario population of adults aged 18 years and over were used to conduct a preliminary investigation of the incidence and correlates of tooth loss and to explore its functional, psychological and social consequences. Of the sample of 500 dentate subjects, 10 per cent reported losing one or more teeth in the previous year. Comparisons between those with and without tooth loss showed significant differences according to age, household income and place of birth. Those subjects wearing partial dentures, possessing fewer teeth at the start of the study period, or who only attended the dentist when having pain or other trouble, were also more likely to have experienced tooth loss in the preceding year. Logistic regression analysis identified only age as a significant independent risk factor. Subjects who lost teeth were significantly more compromised in their oral functions and psychosocial behaviors, as measured by a battery of subjective oral health indicators. Whether or not these problems were pre-existing or the consequences of losing teeth during the past year cannot be determined from this study. This investigation suggests that tooth loss is still a

concern for many Canadian adults, and demonstrates the importance of teeth in their overall well-being.

SOMMAIRE

Pour faire une première étude touchant l'incidence et les corrélations des dents perdues et pour en déterminer les conséquences des points de vue fonctionnel, psychologique et social, on a recueilli, en Ontario, des données bucco-dentaires à l'aide d'un questionnaire posté à des adultes de 18 ans et plus. Sur les cinq cents sujets dentés qu'on a sondés, 10 p. cent ont déclaré avoir perdu une dent ou plus au cours de l'année précédente. En comparant ceux qui avaient perdu des dents à ceux qui n'en avaient pas perdu, on a relevé d'importantes différences suivant l'âge, le revenu familial et le lieu de naissance. Les sujets portant des prothèses partielles et possédant moins de dents au début de la période d'étude, ou ayant visité le dentiste seulement en cas de douleur ou de problème, étaient plus susceptibles d'avoir perdu des dents au cours de l'année précédente. Suivant l'analyse de régression logistique, seul l'âge constituait un important facteur de risque distinct. Comme l'a révélé une batterie d'indicateurs de santé bucco-dentaire subjectifs, les sujets ayant perdu des dents avaient

des fonctions bucco-dentaires et des comportements psychosociaux beaucoup plus compromis. Cependant, on n'a pu déterminer si, oui ou non, ces problèmes existaient auparavant ou s'ils étaient causés par la perte de dents. Quoiqu'il en soit, cette étude indique que les pertes de dents constituent encore un problème pour de nombreux adultes au Canada et démontre l'importance des dents pour le bien-être général.

Introduction

With dentistry continually striving toward the prevention of dental disease and the preservation of the natural dentition, tooth loss is perceived less and less as inevitable, and increasingly as preventable. Because tooth loss is the irrevocable culmination of a variety of physiological and psychosocial factors, the variables posing the greatest risk must be identified to properly design and implement effective preventive programs.

Oral health studies on tooth loss have shown that although edentulism is on the decline, a substantial proportion of adults are still losing teeth. These investigations demonstrate that while dental disease may be the ultimate cause of tooth loss, sociodemographic characteristics can play a funda-

JOURNAL

June/
juin
1994
Vol. 60
No. 6

mental role in the development and progression of this disease, and consequently in the eventual loss of teeth.¹⁻⁹ Moreover, it has been shown that even the attitudes of dentists and patients can influence the decision to extract a tooth.¹⁰⁻¹² As non-biological factors are implicated in the process of losing teeth, research directed toward identifying risk factors other than caries and periodontal disease is important in order to accurately predict the incidence of tooth loss.¹³

Little data are available regarding the psychological and social impacts resulting from the loss of teeth. The psychosocial significance of losing teeth was addressed in a study assessing the amount of readjustment required in relation to a series of life events.¹⁴ When asked to rank 48 life experiences according to degree of coping difficulty, subjects rated losing one or more teeth as 20th and getting dentures as 16th. These results indicate that in comparison to other life events, tooth loss requires a relatively high amount of psychosocial adjustment.

There is a paucity of current Canadian studies concerning tooth loss in adults. With the exception of one investigation pertaining to the prevalence of tooth loss in a sample from Saskatoon¹⁵ and another comparing caries and periodontitis as the major causes of tooth extraction,¹⁶ limited attention has been given to Canadian adult populations.

As the first step in a program of research into tooth loss among Canadians, questions on the loss of teeth during the previous year were included in a survey of the oral health status of adults living in North York, Ontario. The overall objective of the survey was to test the reliability and validity of a battery of subjective oral health indicators, which had been originally developed to study the oral health of the elderly.¹⁷ With respect to tooth loss, the survey's primary purpose was to document the incidence of this condition among adults aged 18 years and older, to identify related sociodemographic and oral health status variables, and to ex-

amine its functional, psychological and social consequences.

Methods

The study population consisted of all adults aged 18 years and older residing in North York, a multicultural and socioeconomically diverse city with a population of 560,000, and one of the five communities that comprise Metropolitan Toronto.

Subjects were selected from the 1991 municipal electoral register using a two-stage, random-start, systematic sampling procedure. Primary sampling units were polling subdivisions and secondary units were named persons. The sampling fractions were adjusted to provide approximately 1,000 subjects. This sample size was based on an expected response rate of 55 per cent, which reflects the rate achieved by the Ontario Ministry of Health in a recent health survey of this population.¹⁸

Data were collected by means of a three-wave mail survey, using a modified version of Dillman's Total Design Method.¹⁹ The first mailing consisted of a covering letter, a questionnaire and a business reply envelope. Two weeks later, subjects who had failed to reply were sent reminder postcards. After an additional two-week period, the remaining non-respondents were sent a third mailing that included another covering letter, a copy of the questionnaire and a business reply envelope.

The self-complete questionnaire used in the study contained questions on tooth loss in the previous year, current number of teeth, subjectively perceived oral health status, frequency of dental attendance, and sociodemographic characteristics.

Tooth loss was assessed by means of a question that asked: "Have you lost any teeth in the previous year?" Subjects who replied in the affirmative were also asked to record the number of teeth lost. Subjective reporting of tooth loss was used because a longitudinal study involving clinical examinations exceeded current resources. There are several reasons to support the validity of self-re-

ports as indicators of tooth loss. First, losing one or more teeth is an invasive, if not traumatic, event that is unlikely to be readily forgotten. Second, the reference period of one year was short to minimize any bias due to failure in recall. Third, the same questions, when used in a three-year follow-up study of older Ontario adults, produced a high level of agreement between the self-reported number of teeth lost and subsequent clinical examinations ($r = 0.82$, $p < 0.001$).²⁰

Subjects were asked if they wore full or partial dentures, and to use a mirror and finger to count and record their existing number of natural teeth. It has been demonstrated that self-reported dentition also has a high level of agreement with clinical assessment.²¹ By adding together the number of teeth present at the time of the survey and the number of teeth lost (if any), an estimate was obtained of the total number of teeth present at the start of the one-year reference period.

The subjective oral health indicators included in the questionnaire assess the functional, social and psychological impact of oral disorders, and consist of the following measures: a six-item index of chewing ability,²² a three-item measure of difficulties with speech, a nine-item inventory of oral and facial pain symptoms experienced over the previous four weeks,²³ a 10-item inventory of other oral symptoms experienced over the previous four weeks, a three-item scale concerning problems with eating, a four-item scale referring to social/communication problems, a six-item scale pertaining to limitations in activities of daily living, a two-item measure of worry concerning dental appearance and health, and three-items to ascertain general satisfaction with oral function and appearance. A single-item self-rating was also included to assess the individual's overall perception of his or her oral health. A more detailed description of these subjective indicators will be presented in another report.¹⁷

Questions measuring problems with eating, social relations, com-

Table 1

Distribution Of Sample Characteristics Compared to Target Population

Characteristics	Sample (%)	Target Population* (%)
Gender		
Male	45.5	47.1
Female	54.5	52.9
Age Group		
18 to 19 years	2.4	** 2
20 to 29 years	20.2	23.8
30 to 49 years	33.1	36.8
50 to 64 years	25.6	21.3
65 years and older	18.7	18.1
Place of Birth		
Canada	57.3	52.3
Other	42.7	47.7
Educational Attainment		
Less than secondary school	21.1	41.3 ^a
Completed secondary school	15.7	12.1
Some post-secondary school	37.4	32.4
Completed university degree	25.9	14.3

*1991 Canadian census data for North York subdivision

^aUnavailable. Census data reported in five-year intervals only

^a1986 North York Social Profile

munication, activities of daily living and worry referred to their frequency of occurrence over the previous year, and were scored using the following categories: never, sometimes, fairly often, very often, or all the time. Subjects were categorized as having a functional, social or psychological problem if they responded sometimes, fairly often, very often, or all the time to one or more scale items. The only exception to this scoring was the scale measuring worry and concern. Because the vast majority reported some degree of worry concerning their oral health, a more stringent cut-off point was used so that only responses of fairly often, very often, or all the time were computed. Overall satisfaction with dental function and appearance was measured according to ratings of: very satisfied, satisfied, dissatisfied and very dissatisfied. Subjects were classified as dissatisfied if they reported any dissatisfaction on at least one of the three items. The single-item subjective evaluation of dental health consisted of ratings of excellent, very good, good, fair and poor.

The question concerning frequency of dental attendance asked if the respondent visited a dentist regularly for an examination or only attended when having pain or other trouble. The sociodemographic information collected consisted of sex, age, place of birth (Canada or elsewhere), educational attainment and household income.

Data were analyzed for dentate subjects only. Comparisons were made between those who had experienced tooth loss within the past year and those who had not. Independent variables were organized into two groups: those that were considered to be predictors of tooth loss and those considered to be consequences of tooth loss. The former group included sociodemographic variables, dental visiting pattern, the wearing of partial dentures and the estimated number of teeth present at the start of the one-year reference period. Chi-square tests were used to assess differences in proportions, and t-tests and analysis of variance were

used to detect differences in means. Associations were considered to be statistically significant when $p < 0.05$. Predictor variables found to be significant were then entered into a logistic regression equation in order to determine which had independent effects. Finally, chi-square analyses were conducted to examine the consequences of tooth loss as measured by the battery of subjective oral health indicators.

Results

Response

A total of 1,181 questionnaires were mailed, of which 122 could not be delivered as the addresses were no longer valid. Of the remaining 1,059 questionnaires, 553 were completed yielding a response rate of 52 per cent. For the purposes of this study, edentulous subjects were excluded, providing a final sample consisting of 500

subjects, all of whom still had some or all of their natural teeth.

Characteristics of Study Subjects

Table 1 presents data on the sociodemographic characteristics of the sample and the target population. In general, subjects were representative of the population. Minor differences were noted in the distributions of age and place of birth. In comparison to the target population, the sample had slightly fewer subjects in the 30 to 49-year-old age group, slightly more subjects aged 50 to 64 years, and a somewhat greater likelihood of having been born in Canada. Greater differences were apparent on the basis of educational attainment. The sample contained a lower percentage of subjects who had not completed secondary school and a higher percentage who had completed a university degree.

Table II

Distribution of Basic Sociodemographic Characteristics and Percentage Reporting Tooth Loss in Previous Year

Sociodemographic Characteristics	Experienced Tooth Loss (%)	Chi Square
Sex		
Male	10.0	$\chi^2 = 0.04$ df = 1
Female	9.5	ns
Age Group		
18 to 29 years	2.8	$\chi^2 = 15.11$ df = 3
30 to 49 years	7.5	$p < 0.01$
50 to 64 years	12.7	
65 years and older	18.2	
Place of Birth		
Canada	6.8	$\chi^2 = 7.06$ df = 1
Other	14.0	$p < 0.01$
Education		
Less than high school	14.9	$\chi^2 = 7.78$ df = 3
Completed high school	10.7	$p = 0.05$
Some post secondary	10.6	
Completed university degree	4.0	
Income		
Less than \$20,000	16.7	$\chi^2 = 13.78$ df = 4
\$20,000 to \$39,999	7.1	$p < 0.01$
\$40,000 to \$59,999	10.5	
\$60,000 to \$79,999	12.5	
\$80,000 or more	0.0	

These discrepancies in educational attainment may be partially attributed to differences between the age ranges of the sample and the target population. Whereas data on the target population included individuals from 15 years of age, the minimum age of subjects in the study group was 18 years. Individuals aged 15 to 17 years are more likely to be in the process of a secondary level education, and less likely to have completed university. Therefore, compared to the study sample, the distribution for the target population would tend to be shifted more toward the lower end of the educational scale. Nevertheless, individuals between 15 and 17 years of age comprise less than seven per cent of the target population aged 15 years and older. It is therefore unlikely that

age alone accounts for this disparity. Consequently, the sample is probably better educated than the population from which it was drawn.

Comparisons of household income were not conducted because 20 per cent of the sample declined to provide this information. The distribution of subjects who did report household income was as follows: less than \$20,000 (18.2 per cent); \$20-39,999 (25.1 per cent); \$40-59,999 (24.1 per cent); \$60-79,999 (14.2 per cent); \$80,000 or more (18.5 per cent).

Self-Reported Tooth Loss

Overall, 10 per cent of dentate subjects experienced tooth loss in the preceding year. The number of teeth lost ranged from one to seven, with a mean loss of 1.76 teeth (SD

= 1.40). Only one-tenth of these subjects lost more than two teeth. Therefore, the number of teeth lost was not included as an independent variable in the analyses.

Table II shows the associations between tooth loss during the one-year study period and the sociodemographic variables. There were no differences between males and females, but significant differences according to age and place of birth. The percentage of subjects who had lost one or more teeth rose progressively from 2.8 per cent of the 18- to 29-year-old population, to 18.2 per cent of those aged 65 years and older. Subjects who were not born in Canada were twice as likely as Canadian-born subjects to have lost teeth (14.0 per cent vs 6.8 per cent; $p < 0.01$).

Of the two variables measuring socioeconomic status, differences by educational attainment were observed, but just failed to reach significance ($p = 0.05$). Differences by household income were significant ($p < 0.01$), but the relationship was not linear. The highest rates of tooth loss were seen in those with a household income of \$19,999 or less (16.7 per cent) and those with an income of \$60,000 to \$79,999 (12.5 per cent).

Table III shows that there was a greater rate of tooth loss in subjects who wore partial dentures and among those who only visited a dentist when experiencing pain or other trouble. With respect to denture wearing, the difference was striking. Nearly five times as many subjects with dentures had lost teeth in comparison to those without dentures (21.3 per cent vs 4.6 per cent, $p < 0.001$).

The estimated number of teeth at the beginning of the one-year reference period was also associated with tooth loss. Subjects who reported losing one or more teeth during the year had a mean number of 20.6 teeth at the start of the study period (SD = 8.12), compared to a mean of 24.8 teeth (SD = 6.71) for those with no tooth loss ($p < 0.001$). Subjects aged 50 years or older had significantly fewer teeth than those aged 18 to 49 years. The mean baseline number of teeth in each age group was as follows: 18 to 29 years, 28.1; 30 to

49 years, 27.6; 50 to 64 years, 22.5; 65 years and older, 17.3 ($F = 72.48$, $p < 0.001$).

Five of the six variables showing significant associations with tooth loss were entered into a logistic regression analysis to test for the independence of effects. Household income was not used in the analysis, since its association with tooth loss was not systematic. In addition, since item non-response was high (20 per cent), the inclusion of household income resulted in the loss of too many cases. All variables except age and the estimated number of teeth at the start of the one-year reference period were entered as dichotomous variables coded 0 and 1. The results are shown in Table IV. Of the five variables, only age emerged as having a significant independent effect ($p < 0.05$). The odds ratio for partial denture wearing was high, but this variable just failed to reach statistical significance ($p = 0.057$).

Functional, Social and Psychological Consequences Of Tooth Loss

Table V shows the percentage of study subjects who reported experiencing functional, social and psychological problems as a result of oral disorders. This table also compares those who did and did not lose teeth in the previous year according to these variables.

Overall, almost one respondent in 10 reported being unable to chew one or more of the six indicator foods comprising the chewing index. A similar proportion reported difficulties with speech, while one-third had experienced oral or facial pain in the previous four weeks, and over half reported one or more other oral symptoms over the same time period. Between 17.2 per cent and 32.5 per cent experienced problems with eating, social relations/communication, or activities of daily living at some time during the year prior to completion of the questionnaire. One in six reported that their oral health was a source of worry and concern, one fifth were dissatisfied with their oral health status, and one fifth reported that their oral health was only fair or poor.

Table III

Per Cent Reporting Tooth Loss by Dental Status Indicators

Dental Indicators	Overall Sample (%)	Experienced Tooth Loss (%)	Chi Square
Wear Partial Dentures			
Yes	28.3	21.3	$X^2 = 32.03$ df = 1 $p < 0.001$
No	71.7	4.6	
Dental Attendance Pattern			
At least once a year	69.6	8.0	$X^2 = 12.30$ df = 3 $p < 0.01$
From time to time for a check-up	10.9	9.4	
Only when having pain or trouble	11.7	22.8	
Never	7.8	7.9	

Table IV

Logistic Regression Analysis Of Risk Factors For Tooth Loss

Dependent variable: Tooth loss (lost one or more teeth = 1, lost no teeth = 0)

Independent Variables	Regression Coefficient	Standard Error	p Value	Odds Ratio
Age (in years)	0.03	0.01	0.039	1.03
Total Number of Teeth (at start of reference period)	0.00	0.03	0.978	1.00
Place of Birth (Canada = 0, Elsewhere = 1)	0.40	0.37	0.279	1.50
Dental Attendance Pattern (Regularly or occasionally = 0, Only when in pain or never = 1)	0.36	0.43	0.400	1.43
Wear Partial Dentures (No = 0, Yes = 1)	0.89	0.47	0.057	2.44

When these subjective oral health indicators were analyzed by whether or not subjects lost teeth in the previous year, differences emerged for eight of the 10 measures. Those losing one or more teeth had significantly more functional, social and psychological problems than those not losing teeth, with the only exceptions being for oral pain and other oral symptoms. In addition, they were more likely to worry, be dissatisfied and view their oral health as being poor.

Discussion

Because there is little current data concerning tooth loss in Canada, this preliminary study was conducted primarily to explore the incidence of tooth loss in a Canadian population and to examine

some of the associated risk factors and consequences. The results of this investigation indicated that one-tenth of the population surveyed experienced tooth loss in a one-year period. Several of the variables studied were found to be significantly related to losing one or more teeth. Adults who had lost teeth during this time frame experienced more functional, social and psychological problems due to their oral health, as measured by a battery of subjective oral health indicators.

Although the low response rate of 52 per cent is consistent with that reported in a recent survey study of this population,¹⁸ the generalizability of these results is somewhat uncertain because close to half of those sampled did not complete the questionnaire. Nonetheless, those who did participate were

Table V

Percentage of Subjects With and Without Tooth Loss During the Past Year Reporting Oral Health Problems

Oral Health Indicators	Overall Sample (%)	Tooth Loss (%)	No Tooth Loss (%)	Chi Square
Chewing Limitations	9.4	25.0	7.7	$\chi^2 = 15.19$ df = 1 p < 0.001
Pain Symptoms in Past Four Weeks	33.9	45.8	32.7	$\chi^2 = 3.35$ df = 1 ns
Other Oral Symptoms in Past Four Weeks	53.6	62.5	52.6	$\chi^2 = 1.70$ df = 1 ns
Difficulty Speaking	8.8	16.7	7.9	$\chi^2 = 4.11$ df = 1 p < 0.05
Problems Eating	32.5	62.5	29.3	$\chi^2 = 21.81$ df = 1 p < 0.001
Restricted Social/Communication Relations	23.1	45.8	20.6	$\chi^2 = 15.47$ df = 1 p < 0.001
Restricted Activities of Daily Living	17.2	50.0	13.6	$\chi^2 = 40.30$ df = 1 p < 0.001
Worry Over Dental Health & Appearance	15.5	31.3	13.8	$\chi^2 = 10.00$ df = 1 p < 0.01
Dissatisfaction With Oral Function & Appearance	17.8	35.4	15.9	$\chi^2 = 11.30$ df = 1 p < 0.001
Dental Health Rated Fair or Poor	20.9	60.0	16.9	$\chi^2 = 45.85$ df = 1 p < 0.001

generally representative of the target population. Overall, respondents were comparable to the target population with respect to gender, age and place of birth, but were more highly educated. Because education and oral health tend to be inversely related,^{1,24} it is possible that oral health problems may have been under-reported in this study.

The sociodemographic variables of age and household income both had significant relationships with tooth loss in the previous year. These results support those found in studies conducted in other countries.^{2,5,8,24} People born in a country other than Canada were twice as likely to have lost one or more teeth during the one-year reference period. This difference may be partly due to less variation among the group of Canadian-born adults with respect to their exposure to dental practices, behaviors and services.

The dental status indicators of number of teeth and current wearing of partial dentures were also significantly related to tooth loss.

These findings suggest that individuals who have already lost teeth are at an increased risk of losing more. Further studies are necessary to fully investigate which factors promote this vulnerability to losing teeth.

In an effort to identify the strongest predictors of tooth loss, the sociodemographic variables of age, place of birth and education, along with the dental status indicators of number of teeth, the wearing of partial dentures and dental attendance pattern, were used to construct a logistic regression model. Although the wearing of dentures approached significance ($p = 0.057$), only age was identified as a significant risk factor. This study found that only a small proportion of people under the age of 30 were affected by tooth loss. However, the likelihood of losing teeth rose progressively with age until nearly one-fifth of adults aged 65 years and older had lost teeth in just a 12-month period. The number of teeth at the start of the study period was also inversely related to age, with significantly more teeth miss-

ing in those aged 50 years or more. This increase in tooth loss is unlikely to be the product of the physiological process of aging alone, as studies have shown that tooth loss is declining across all age groups.^{25,26} This suggests that other factors are involved in the relatively higher rates of tooth loss found in older adults.

Tooth loss was also significantly associated with functional, psychological and social problems. With the exceptions of pain and other oral symptoms, the subjective indicators showed that adults who had experienced tooth loss in the previous year were more likely to have suffered consequences as a result of their oral health. Questions on both pain and other oral symptoms confined responses to the four-week period immediately prior to completing the survey. Because tooth loss may have occurred at any time during the year, a greater association with these symptoms might have been found had a four-week time restriction not been placed. However, limiting responses to a shorter time interval provided a means of assessing whether individuals who had lost teeth during the past year were also more likely to have persistent oral health problems. Such a propensity could consequently contribute to higher scores on the other scales as well. Results indicated that on both measures of pain and oral symptoms, there were no differences between those who did and did not lose teeth.

While these oral health problems have been labelled as being consequences of tooth loss, the cross-sectional design of the study means that they are more appropriately viewed as correlates of tooth loss. Since those losing teeth during the course of the study year had fewer teeth to begin with, it is likely that some, if not all, were already compromised in terms of their functional, social and psychological well-being. Whether the loss of additional teeth created or exacerbated their problems cannot be determined by this study. Nevertheless, the study does highlight the crucial role of teeth in the overall health and well-being of individu-

als, and supports dentistry's continued efforts to preserve the natural dentition. ■

Acknowledgements: This research was supported by the Ontario Ministry of Health, grant no. 04170.

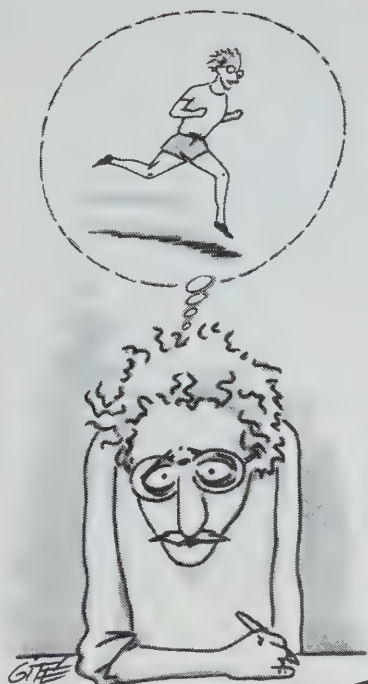
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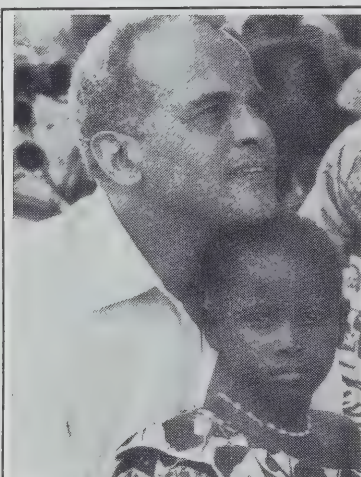
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JOURNAL

June/
June
1994
Vol. 60
No. 6



Paresthésie du nerf dentaire inférieur à la suite d'un traitement endodontique: Un cas clinique

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ABSTRACT

Paresthesias of the lower dental nerve can occur after many procedures: surgery of impacted teeth, apicectomy, endodontic treatment, etc. This article is based on a clinical case and deals with a paresthesia resulting from an endodontic treatment, its means of prevention and its cure.

SOMMAIRE

Les paresthésies du nerf dentaire inférieur peuvent survenir après diverses interventions : chirurgie de dents incluses, apicectomie, traitement endodontique, etc. Cet article, basé sur un cas clinique, traite d'une paresthésie résultant d'un traitement endodontique, des moyens de prévention et la façon d'y remédier.

Introduction

On retrouve deux groupes de paresthésie, soit la paresthésie permanente et la paresthésie temporaire. Les paresthésies dites temporaires sont celles qui disparaissent à l'intérieur d'une période approximative de 6

mois; au-delà de cette période, elles risquent d'être permanentes.

En endothérapie clinique, les facteurs étiologiques responsables d'une paresthésie peuvent être classifiés en trois groupes différents¹ :

1. *Dommages Mécaniques* : survenus lors d'un dépassement apical des instruments (limes, alésoirs, etc.).
2. *Dommages Chimiques* : causés par les agents médicamenteux employés lors d'un traitement de canal (ex. : solutions d'irrigation et médication intra-canalaires).
3. *Dommages Mécano-Chimiques* : causés par la présence de matériaux d'obturation (ciment, pâtes, gutta, etc.) à proximité ou directement en contact avec le nerf dentaire.

Un des principes fondamentaux dans le domaine de l'endodontie est le respect de l'anatomie du système endocanalinaire. Toutes les étiologies des paresthésies ont en commun le dépassement exagéré à l'apex. Il serait donc important de se rappeler les notions de la limite apicale durant la préparation et l'obturation canalaire. Limiter le nettoyage et la mise en forme à la portion dentinaire du canal nous impose une préparation qui s'arrête à la jonction cémento-dentinaire ou constriction apicale² (voir

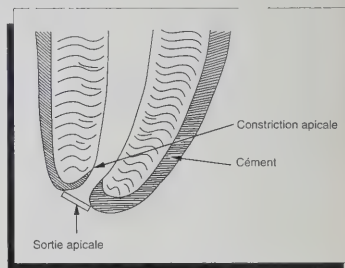


Fig. 1: Schéma de KUTTLER montrant la constriction apicale à respecter.

schéma de Kuttler, Fig. 1³). Cette constriction se situe normalement entre 0,5 et 1,0 mm de l'apex radiologique. Tout dépassement risque de causer des dommages aux tissus périapicaux, qui peuvent se traduire par un échec du traitement ou, parfois, par une paresthésie du nerf dentaire inférieur.

Histoire de cas

À la clinique dentaire de l'urgence de l'hôpital St-Mary's, une jeune femme de 22 ans se présente, se plaignant de douleur importante et d'enflure au niveau de la mâchoire gauche. L'histoire médicale s'avère non significative; la médication se limite à l'Amoxil 500 mg trois fois par jour et à un composé d'Empracet et de Motrin 600 mg.

Par contre, l'histoire dentaire nous révèle que la patiente a subi

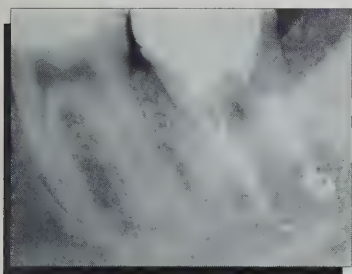


Fig. 2: Radiographie prise lors de l'examen d'urgence où on note un dépassement important de la gutta.

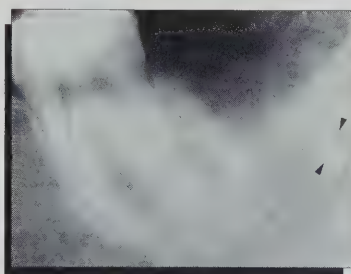


Fig. 3: Radiographie prise immédiatement après l'extraction chirurgicale. Remarquez la gutta encore présente.



Fig. 4: Photo de la dent extraite. Plusieurs cônes de gutta dépassent largement l'apex: une conséquence du non respect de la limite apicale.

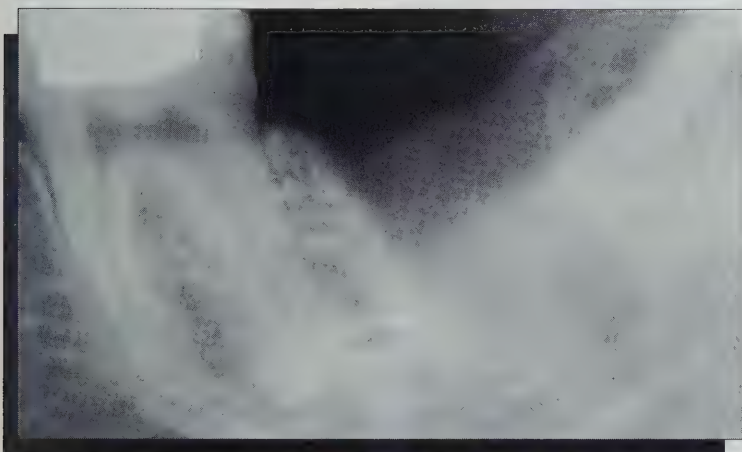


Fig. 5: Radiographie du site d'extraction après le curetage.

une reprise de traitement endodontique une dizaine de jours auparavant. Le traitement initial avait débuté il y a 3 ans.

L'examen clinique révèle un trismus marqué, limitant amplement l'ouverture de la bouche, et une enflure importante au niveau de la joue et de la région sous-mandibulaire. La dent causale, soit la deuxième molaire inférieure gauche (no 37), est très douloureuse à la percussion. La patiente se plaint d'avoir la lèvre et le menton engourdis depuis le jour de l'obturation canalair. La gencive au niveau des dents nos 33, 34 et 35 est aussi paresthésiée.

La radiographie (**Fig. 2**) montre un dépassement de plusieurs millimètres de la gutta au niveau des deux racines, situé directement sur le nerf dentaire inférieur.

Le plan de traitement fut donc de contrôler l'infection périapicale et de réduire le trismus, et ce, afin de permettre l'extraction de la dent en question. Dix jours plus tard, suite à une prescription de Dalacin C 150 mg QID / 10 jours et de Tora-

dol 10 mg, la dent a pu être extraite chirurgicalement, les signes d'infections ayant disparu (trismus, enflure, douleur). L'excès de la gutta-percha, située à l'apex de la racine distale, a été enlevée par un léger curetage (**Fig. 3**). Une diminution de la paresthésie était notée après une semaine, bien que toujours légèrement présente au niveau de la lèvre seulement. Ce n'est que trois mois plus tard que tout signe et symptôme subjectifs de la paresthésie ont complètement disparu.

Discussion

Le praticien se doit de mesurer avec exactitude la difficulté d'un traitement de canal avant de l'entreprendre. Ainsi, les dents postérieures inférieures qui semblent être à proximité de la troisième branche du trijumeau sont des dents à risque de paresthésie et nécessitent une grande dextérité et une maîtrise des actes opératoires cliniques de l'endodontie.

Le viol de la limite apicale, lors d'un traitement de canal sur une

dent dont les apex sont à proximité du nerf dentaire inférieur, peut causer des dommages sérieux et même une paresthésie temporaire ou permanente. Il est donc très important de connaître ces dangers et de les prévenir puisque la majorité de ces situations sont iatrogéniques.

La littérature^{1,4,5} mentionne une corrélation directe entre la durée, l'importance du traumatisme et le pronostic de la paresthésie. Plus l'irritation mécanique ou chimique persiste, plus grand est le risque de dégénérescence des tissus nerveux et, par conséquent, plus les chances de paresthésie permanente sont élevées. Il est donc impératif d'agir rapidement après avoir diagnostiqué un cas de paresthésie résultant d'un dépassement à l'apex.

C'est pour ces raisons que la dent n° 37 du cas clinique présenté a été extraite dès que la situation clinique l'a permis (disparition du trismus). La paresthésie pouvant parfois être causée par une réaction inflammatoire passagère des tissus périapicaux, des anti-inflammatoires peuvent alors être utilisés, et la situation peut ainsi se normaliser.¹ Dans le cas clinique rapporté, la majorité des symptômes avait disparu une semaine après l'extraction, mais il a fallu trois mois pour que toute sensation de paresthésie soit disparue. L'ensemble des ouvrages publiés mentionne ainsi une attente pouvant aller jusqu'à six mois.^{1,4}

Conclusion

Suite à un traitement endodontique, une paresthésie du nerf dentaire inférieur est une séquelle grave et peut parfois devenir irréversible.



La littérature préconise une intervention rapide pour corriger cette complication iatrogénique. Il est beaucoup plus facile de prévenir que de guérir,⁶ et c'est pourquoi le concept de la limite apicale prend ici une importance indiscutable. ■

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INDICATIONS AND CLINICAL USE: Peridex is indicated for use as part of a professional program for the treatment of moderate to severe gingivitis, and for management of associated gingival bleeding and inflammation between dental visits. For patients having coexisting gingivitis and periodontitis, see PRECAUTIONS.

CONTRAINDICATIONS: Peridex should not be used by persons who are known to be hypersensitive to chlorhexidine gluconate or other formula ingredients.

WARNINGS:

USE IN PREGNANCY: Reproduction and fertility studies with chlorhexidine gluconate have been conducted. No evidence of impaired fertility was observed in male and female rats at doses up to 100 mg/kg/day, and no evidence of harm to the fetus was observed in rats and rabbits at doses up to 300 mg/kg/day and 40 mg/kg/day, respectively. These doses are approximately 100, 300, and 40 times that which would result from a person ingesting 30 ml (2 capfuls) of Peridex (0.12% chlorhexidine gluconate) per day. Since controlled studies in pregnant women have not been conducted, the benefits of use of the drug in pregnant women should be weighed against possible risk to the fetus.

NURSING MOTHERS: It is not known whether this drug is excreted in human milk. In parturition and lactation studies with rats, no evidence of impaired parturition or of toxic effects to suckling pups was observed when chlorhexidine gluconate was administered to dams at doses that were over 100 times greater than the dose which would result if a person ingested the entire recommended dose of Peridex (0.12% chlorhexidine gluconate) on a daily basis.

USE IN CHILDREN: Since the safety and efficacy of Peridex in children has not yet been fully established, the benefits of its use should be weighed against the possible risks.

PRECAUTIONS:

1. For patients having coexisting gingivitis and periodontitis, the absence of gingival inflammation following treatment with Peridex may not be indicative of the absence of underlying periodontitis. Appropriate treatment of periodontitis is therefore indicated.

2. Peridex may cause staining of oral surfaces such as the film on tooth surfaces, restorations, and the dorsum of the tongue. Stain will be more pronounced in patients who have heavier accumulations of unremoved plaque.

Stain resulting from use of Peridex does not adversely affect the health of gingivae or other oral tissue. Stain can be removed from most tooth surfaces by conventional professional prophylactic techniques. Additional time may be required to complete the prophylaxis.

Discretion should be used when treating patients with exposed root surfaces or anterior facial restorations with rough surfaces or margins. If natural stains cannot be removed from these surfaces by a dental prophylaxis, patients should be excluded from Peridex treatment if the risk of permanent discoloration is unacceptable. Stains in these areas may be difficult to remove by dental prophylaxis and on rare occasions may necessitate replacement of these restorations.

3. A few patients may experience a slight and temporary alteration in taste perception while undergoing treatment with Peridex. Most of these patients accommodate to this effect with continued use of Peridex.

4. For maximum effectiveness the patient should avoid rinsing their mouth, eating or drinking for about 30 minutes after using Peridex.

ADVERSE REACTIONS: No serious systemic reactions associated with use of Peridex were observed in clinical testing. However, some adverse reactions have been reported in studies with Peridex or other chlorhexidine-containing mouth rinses. The most common side effects associated with chlorhexidine gluconate oral rinses are (1) an increase in staining of oral surfaces, (2) an increase in supra gingival calculus and (3) a slight and temporary alteration in taste perception. (see PRECAUTIONS). Epithelial irritation and superficial desquamation of the oral mucosa have been noted in studies of children using 0.12% chlorhexidine gluconate which were reversible upon discontinuation.

There have been rare cases of parotid gland swelling and inflammation of the salivary glands, in patients using Peridex.

SYMPTOMS AND TREATMENT OF OVERDOSAGE: Ingestion of 100 ml of Peridex (0.12% chlorhexidine gluconate) by a (10 kg or less body weight) might result in gastric distress, nausea, or signs of alcohol intoxication. Medical attention should be sought if more than 120 ml of Peridex is ingested by a small child. Signs of alcohol intoxication develop.

DOSAGE AND ADMINISTRATION: Peridex therapy should be initiated following a dental prophylaxis. Patients using Peridex should be reevaluated and given a thorough prophylaxis at intervals no more than six months; they should be referred for periodontal consultation if necessary.

Recommended use is twice daily oral rinsing for 30 seconds, morning and evening after tooth brushing. Usual dosage is 15 mL (one capful) of undiluted Peridex. Peridex is not intended for ingestion and should be expectorated after rinsing. Rinsing the mouth, eating or drinking should be avoided for about 30 minutes after using Peridex.

The suggested initial course of therapy is 3 months, at which time the patient should be recalled for evaluation. At the time of the recall visit, the professional should:

— Evaluate progress, remove any stain, and reinforce proper brushing techniques.

— If gingival inflammation and bleeding is controlled, discontinue therapy and recall the patient in three months to assess gingival health.

— If gingival inflammation and bleeding persists, continue Peridex therapy for an additional 3 months and schedule a three-month evaluation.

— Evaluate for evidence of epithelial irritation, desquamation, or gingivitis.

The following generally accepted grading scheme may be used to evaluate the severity of gingivitis.

Loe and Silness GINGIVAL INDEX (GI)

Grade	Description
1	Normal gingiva, no inflammation, no discoloration or bleeding.
2	Mild inflammation, slight color change, mild swelling, no bleeding.
3	Moderate inflammation, erythema, swelling, on probing or when pressure applied.
4	Severe inflammation, severe erythema and swelling, tendency toward spontaneous hemorrhage, some ulceration.

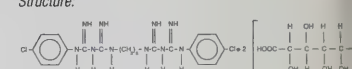
An occasional missed dose can be ignored if the patient is compliant with the prescribed regimen.

PHARMACEUTICAL INFORMATION DRUG SUBSTANCE

Proper Name: Chlorhexidine gluconate (U.S.A.N.)

Chemical Name: 1,1'-hexamethylene bis [5- (p-chlorophenyl)-2,4-dihydroxy-6-methyl-4-pyridylmethyl] di-D-gluconate

Structure:



Molecular Weight: 897.8

Description:

Chlorhexidine has basic character and exists in the di-cationic physiological pH. The two protonic positive charges become localized on the bi-guanide portion of the molecule. Both pK_a values are 10.78 ± 0.06. The gluconate salt is soluble in excess water at 20°C.

At 19–21% w/v chlorhexidine gluconate solution is colorless, straw-colored and is odorless to almost odorless (Pharmacopoeia).

COMPOSITION: Peridex contains 0.12% chlorhexidine gluconate containing water, alcohol, glycerin, PEG-40 sorbitan diester, flavour, saccharin sodium and FD&C Blue #1 Dye.

STABILITY AND STORAGE: Store above freezing (0°C).

INCOMPATIBILITIES: None known.

SPECIAL INSTRUCTIONS: None.

AVAILABILITY OF DOSAGE FORM: Peridex oral rinse (0.12% chlorhexidine gluconate) is supplied as a blue liquid in 475 mL amblytics with child-resistant dispensing closures.

Store above freezing (0°C).

REFERENCE

1. Grossman E., Reiter G., Sturzenberger OP, et al. Six-month effects of a chlorhexidine mouthrinse on gingivitis. *Journal of Periodontal Research*. 1986;21(suppl 16):33-36.

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The *Journal* of the Canadian Dental Association welcomes the submission of previously unpublished articles, critical reviews of material on advances in dentistry, and clinical reports for consideration for publication. Material is accepted for publication on the understanding that it is submitted solely to the *Journal* and that it has not previously been submitted elsewhere.

Scientific Articles:

Are contributions dealing with research, diagnosis and treatment of dental disease, studies in education, clinical and laboratory research, and other detailed investigations pertinent to dentistry and related fields. The text should not exceed 2,500 to 3,000 words.

Clinical Reports:

Are brief (up to 2,000 words) reports, case histories and clinical observations. References should be limited and a minimum number of illustrations used.

Opinions:

That are fully documented (800 words or less) will be reviewed for publication at the discretion of the editor.

Manuscript Requirements:

Submit three (3) copies (original and two (2) duplicates) to the Editor, *Journal of the Canadian Dental Association*, 1815 Alta Vista Drive, Ottawa, Ontario K1G 3Y6. All graphs, photographs, charts and tables must also be submitted in triplicate. Authors are asked to submit their articles on computer disks, if possible, stored in Word Perfect, Word Star or ASKE. (IBM compatible programs, i.e. DOS-based, are definitely preferred.) Hard copy, in triplicate, must still be provided for articles submitted on disk. For more details, please contact the editorial staff.

A covering letter designating one author as the correspondent, with his or her full address, telephone number and fax number (if available), must accompany the article. All scientific articles are subject to review by selected consultant referees. Acceptance or rejection of an article for publication is based on the referees' reports plus editorial consideration.

The editor reserves the right to edit manuscripts for stylistic consistency, clarity and conciseness. The author named as correspondent will receive a copy of the edited manuscript for checking prior to publication. If the author does not respond promptly,

within the time allotted, his or her acceptance of the final article will be assumed. No exceptions will be made.

Manuscript Format:

All material (title, abstract, text, references, tables and legends) should be typed, double-spaced, on one side of 8 1/2" x 11" pages, with margins of at least one inch on all four sides.

Article Titles:

Should be descriptive but concise and suitable for indexing. Lengthy titles will be subject to editing.

Abstract:

Stating the purpose, results and conclusion of the work must accompany all manuscripts. All abstracts will be translated into French (or English, as the case may be). Abstracts should be approximately one typewritten page (250 words in length), maximum.

Authors Affiliations:

The authors' names, degrees, and university affiliations must be provided. Authors are responsible to disclose to the Editor any financial interests they may have in products mentioned in their article.

References:

Should be selective. They must be keyed to the text and numbered consecutively. *Journal* references must give the author's name, article title, abbreviated journal name, volume number, first and last page numbers of article and year of publication, i.e., 1. Hechter, F.J., Symmetry and dental arch form of orthodontically treated patients. *JCDA* 44:173-184, 1978.

For books, give the author's name, book title, location and name of publisher, and year of publication, i.e., 2. Kilpatrick, H.C. *Work simplification in dentistry*, ed. 2, Philadelphia, Saunders, 1964.

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Should be of high (professional) quality for reproduction.

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On the back of each print or slide, the figure number and the top edge should be indicated lightly using a grease pencil. Each set of photographs and slides should be placed in a separate envelope and marked with the

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JOURNAL

June/
June
1994
Vol. 60
No. 6

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BRITISH COLUMBIA - Vancouver: Seeking motivated individual with strong people skills and minimum two years experience for full-time position in clinic that provides a full range of dental services. Applicant must be willing to work evenings/weekends and desire to learn practice management skills to run office independently. Strong buy-in potential for the right individual. Send resume with references and covering letter discussing the ideal type of clinic YOU want to work in. Please reply to Suite 501 - 1477 Fountain Way, Vancouver, BC V6H 3W9. (03/06)

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ONTARIO - Sudbury: Associate wanted for two dental offices: Modern store front location, computerized office located in strip mall with other professional offices in a great location, second office located in a professional building in nearby Noelville, (only dentist in an area population of 5,000). Excellent associate earning opportunity. Hospital privileges and possible government grant available. Call (705) 522-4252 or (705) 523-1643. (05/06)

ONTARIO - Toronto: Endodontist wanted, excellent opportunity for endodontist to establish a practice in connection with other specialists in east-end Toronto. Recent graduate or established endodontist please reply to CDA ACCESS Box 2623. (05/06)

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Our annual Bermuda Dental Association Convention will be held at the Hamilton Princess Hotel, Pembroke, on July 4th, 5th and 6th 1994.

GUEST SPEAKER: Linda L. Miles, C.SP., C.M.C.
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Hotel accommodations should be made as soon as possible with your local travel agent, or by calling the Hamilton Princess at 1-800-223-1818 in the U.S. or 1-800-268-7176 in Canada.

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ANNOUNCEMENTS

National Highlights

October 2-8, 1994
Joint CDA/FDI
Annual Dental Meeting
 Vancouver, BC
 (613) 523-1770,
 or 1-800-267-6354

July/Juliet 1994

July 15-17: The American Academy Of Periodontology and American College of Prosthodontists are sponsoring a Joint Conference On Implants, to be held in Chicago, Illinois, at the Sheraton Chicago Hotel and Towers. For more information, contact the AAP's department of meetings and membership services at (312) 573-3210.

August/Août 1994

August 18-20: Bone Augmentation and Tissue Guidance, two-day implant seminar presented jointly by the Vancouver Implant Seminar (Study Club) and the Canadian Society of Oral Implantology in Vancouver, B.C. For information, contact: Vic, Barry or Linda at (604) 298-4232.

August 18-20: Atlantic Provinces AGD Annual Convention in Brudenell, P.E.I. Speakers: Robin Wright (Interoffice Communications) and Dr. Michael Horsman (Pharmacology Update). For information, contact: Dr. Richard Holden at (902) 566-5133 or Dr. Jack Thompson at (506) 847-4243.

August 24-28: The Canadian Academy of Endodontics — 30th Annual Meeting in Kananaskis, Alberta. For information contact: Dr. K. Fuhrman, Suite 260, Bankers Hall, 315-8th Avenue S.W., Calgary, Alberta T2P 4K1. Tel.: (403) 263-1343.

September/Septembre 1994

September 8-13: 32nd Iranian Annual Dental Association Congress and 12th International Dental Ex-

hibition in Teheran, Iran. For information, contact: A.H. Arfaei, Iranian Dental Association, P.O. Box 14155 - 3695 IR - Teheran, Iran.

September 14-18: 17th Biennial Conference of the New Zealand Dental Association in Christchurch, New Zealand. For information, contact: N.Z.D.A. Biennial Conference Committee, P.O. Box 1183, Christchurch, New Zealand.

September 22-24: Canadian Academy of Restorative Dentistry and Prosthodontics and The Association of Prosthodontists of Canada — Joint Scientific Meeting to be held at the Banff Springs Hotel, Banff, Alberta. For information contact: Dr. Edward W. McIntyre, 164 Meadowlark Shopping Centre, Edmonton, Alberta T5R 5W9. Tel.: (403) 484-1336 or Fax: (403) 489-4930.

September 24-25: 11th International Oral Implant Symposium in Bali, Indonesia. For more information call: (65) 734 3162.

October/Octobre 1994

October 7: Canadian Academy of Pediatric Dentistry in Vancouver, B.C. For information contact: Dr. Ian Bennett, Executive Director, Canadian Academy of Pediatric Dentistry, 4095 Puget Drive, Vancouver, B.C. V6L 2V3. Tel.: (604) 733-7976 or Fax: (604) 733-7996.

October 13-15: The 38th Canadian Dental Association Teaching Conference will be held in Toronto, on the topic of Dental Clinical Epidemiology and Decision Making. For further information, please contact Ms. Gay MacQuarrie at (613) 523-1770, ext. 209.

October 24-28: Turkish Society of Restorative Dentistry's 2nd International Congress in Istanbul, Turkey. The main topic is "Lasers in dentistry" (Simultaneous interpretation between English and Turkish will be provided). For information, contact: Mete Üçok, University of Istanbul, Faculty of dentistry, 34390 Capa, Istanbul, Turkey.

October 31-November 5: Joint Meeting of the Canadian Society of Forensic Science & Northwest Association of Forensic Scientists at the Waterfront Hotel in Vancouver, B.C. For information, contact: Jeffrey Caughlin, R.C.M.P. Forensic Laboratory, 5201 Heather Street, Vancouver, B.C. V5Z 3L7. Tel.: (604) 264-3507 Fax: (604) 264-3499.

November/Novembre 1994

November 3-5: The Croatian Dental Society and the School of Dentistry, University of Zagreb, are organizing the 1st World's Congress of Croatian Dentists, which is to be held in Zagreb. For information contact: AS - Kongresni Servis, Lastovska 23, 41 000 Zagreb, Croatia. Tel.: 385 41 624 100, 624 101 or Fax: 385 41 624 424.

November 3-5: The American College of Prosthodontics — Annual Session at the Hyatt Regency Hotel, New Orleans, Louisiana. For information, contact The American College of Prosthodontists, tel.: (210) 829-7236.

November 22-25: Congrès de l'Association Dentaire Française in Paris, France. For information, contact: Dr. Alain Deyrolle, 92 Avenue de Wagram, 75017, Paris, Tel.: (1) 42 27 89 00.

November 22-25: XIIIth International Dental Film and Video Festival in Paris, France. For information, contact: Dr. Maurice Dolovici, Secrétaire Général, Association Dentaire Française, 92 avenue de Wagram, F-75017 Paris, France.

February/Février 1995

February 16-18: 25th Annual Miami Winter Meeting in Miami, Florida. For information contact: East Coast District Dental Society, 420 South Dixie Highway, 2-E, Coral Gables, Florida 33146. Tel: (305) 667-3647 or Fax: (305) 665-7059.

February 15-19: The Jamaica Dental Association's 31st National Convention will be held at the Jamaica Grande, Ocho Rios. For more information, contact Aurora Travel Services at 1-800-451-5421.

March/Mars 1995

March 1-4: Australian & New Zealand Association of Oral and Maxillofacial Surgeons, XVIth Biennial Clinical Conference, Towards 2000: Form & Function, being held at the Park Grand Hotel in Sydney, Australia. For information contact: ANZAOMS Conference 1995, Professional Centre of Australia, Private Bag No 1, Darlinghurst NSW 2010. Tel: 02 331 6920 or Fax: 02 331 7296.

March 18-22: Australian Dental Association, 28th Australian Dental Congress in Hobart, Tasmania. For information contact: 28th Australian Dental Congress, C/O Mures Convention Management, Victoria Dock, Hobart, Tasmania, 7000. Tel: (002) 31 2121 or Fax: (002) 34 4464.

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For information contact:

(Endodontics)
Dr. Don Chorkawy
Tel: (807) 345-0727

(Oral Pathology)
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October 20-21: The Current Treatment and Management of T.M. Disorders

This program is developed by Dr. George Zarb, professor and head of the prosthodontic department, faculty of dentistry, University of Toronto.

November 24-26: Nitrous Oxide in Dental Practice

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For information contact:

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Faculty of Dentistry
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For information contact:

Karen Lacis
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(From *Medical Post*, October 12, 1993)

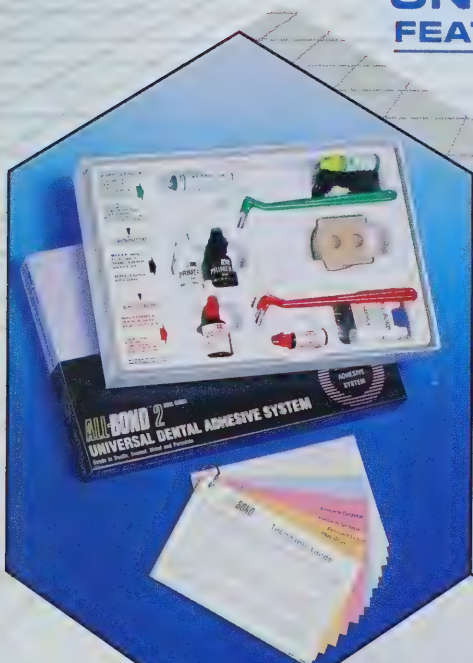


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